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# VETERINARY MEDICINE

JUNE 1945

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VOL. XI.
No. 6

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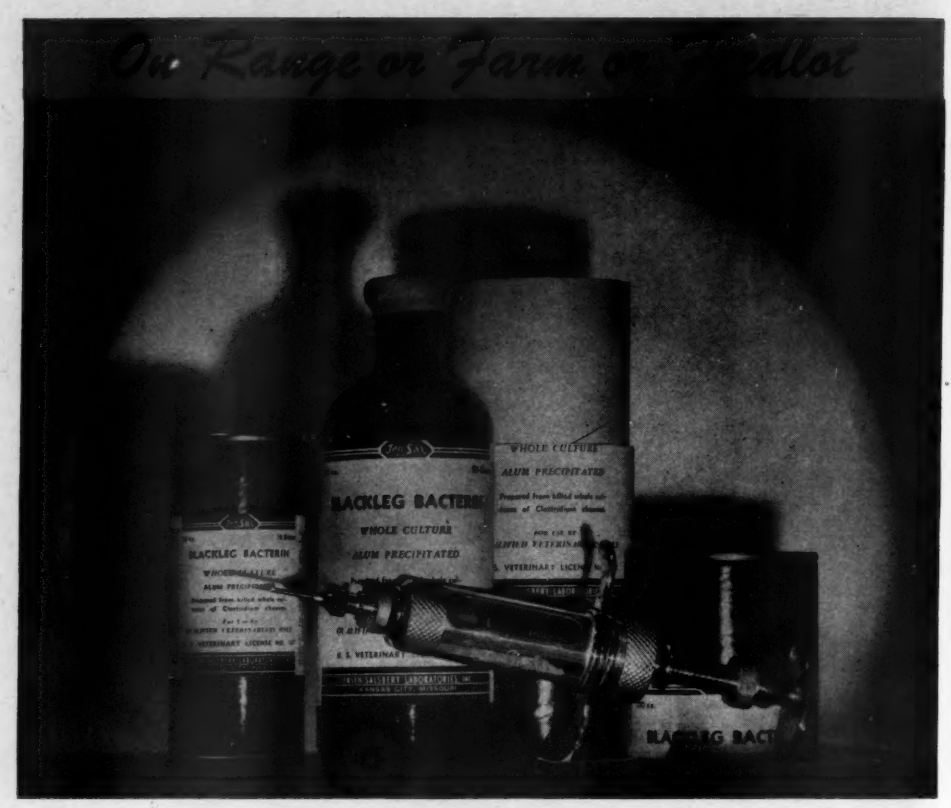


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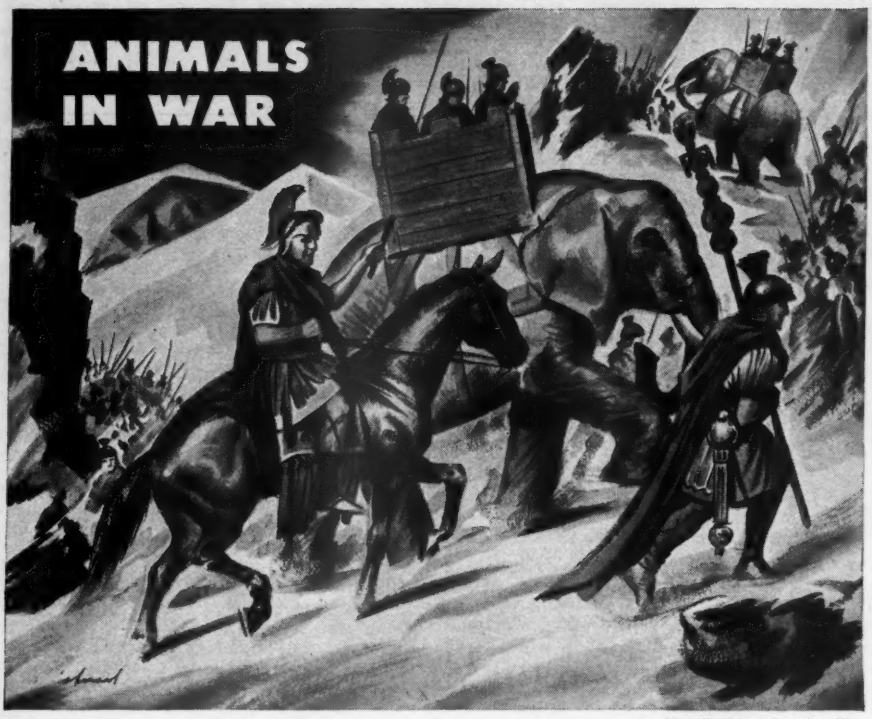


Hannibal crossing the Alps

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# VETERINARY MEDICINE

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## May 8, 1945

**Two down and one to go—a tough one.**

Experiments at the Wyoming experiment station to determine the effects of vegetable protein on meat quality of turkeys indicated that when fed corn gluten meal the flesh had a yellow color and when cooked was jucier than when soybean or cottonseed meal was the concentrate used.

It was shown in research at the Wisconsin station that sulfadiazine is an effective treatment for coccidiosis in chickens. In more than 30 experiments sulfadiazine, given before the seventh day after infection, halted the progress of the disease and eliminated the danger that sick birds would spread the infection. A five-day course of treatment was required to eliminate clinical manifestations of the disease in an infected flock.

Two cheese borne outbreaks of typhoid fever, one in Quebec and the other in Ontario occurred early in 1944. The outbreaks comprised 30 cases and there were two deaths. But for prompt action by the Provincial Health Department the number of cases might have been large as a high percentage of those who ate of the infected cheese contracted the disease. In two cases infected persons were known to have eaten of the cheese but one time. The cheese was manufactured from unpastuerized milk and ripened only two weeks before being sold.

The Metropolitan Life Insurance Company of New York places military death losses in action for all belligerents as probably exceeding two million during 1944—more than 900,000 for the Allied Nations and exceding 1,250,000 for the Axis.

American losses were put at 145,000—about five times as many as for 1943. Russian losses were estimated at 550,000; British Empire 125,000, Chinese 50,000, French 10,000; Yugoslavs, Norwegians, Dutch, Belgians, Greeks, Poles and Czechs many additional thousands.

German losses are conservately estimated at 800,000; Japanese at 350,000 to 400,000; Rumania and other Axis satelites at 100,000.

The Army spent over 2¼ billion dollars for food in 1944; 60% of it for meat, meat food and dairy products, which comprise 38% of the ration.

The number of penicillin injections given to patients can be reduced from eight to three when the drug is mixed with a special gelatin and an excipient of the kind used in nose drops.

Under conditions of shock,[1] if the liquid—plasma, gelatin or saline—is administered in small amounts over an extended period the results are more highly efficacious in preventing shock than when it is given in a single massive administration.

Since plague is a serious health problem in parts of Hawaiian Islands, experiments were conducted to find if penicillin is effective in combating the disease. The Board of Health of the Territory of Hawaii made many tests with guinea pigs experimentally inoculated with bubonic plague and the results indicate that penicillin is not effective in combating the plague.

Judges of dairy cattle have long given attention to the size of surface veins on the udder, the size and tortuousness of the "milk veins" and the size of the milk well as indicative of milk production in the cow. The Bureau of Dairy Industry, U.S.D.A., after considerable study of the matter reached the conclusion that these indices bear little or no relation to the milk production capacity in the animal.

In an experiment at the Mayo Clinic, guinea pigs infected with *Leptospira icterohemorrhagiae* survived if penicillin was administered within 17 to 72 hours after inoculation. In an experiment at the control laboratory of the National Institute of Health, Swiss mice recovered from leptospirosis if given penicillin within 48 hours after infection. If treatment was delayed until symptoms appeared, a majority of the infected animals died. After jaundice was in evidence, penicillin teatment was ineffective.

[1] McKee, F. W., Laycock, C. F., Martens, T. G., and Nichol, R. J. *Surg., Gynec. & Obst.*, 78:590, 1944.

## Meat Ceilings

Statement by Claude R. Wickard, Secretary of Agriculture, March 28, 1945:

From statements appearing in the press and elsewhere it is possible to gain the impression that lifting the ceilings on livestock and meat would increase the production or marketing of meat animals. In my opinion this is not true. In this connection I think it well to consider the following facts:

1. The shortage of meat is due to a greatly increased demand since actual amounts of meat available or in prospect for 1945 are at a high level. Over-all meat production—pork, beef and veal, and lamb and mutton—is estimated at almost 22.4 billion pounds dressed weight for the calendar year 1945. This is 38 percent above average amounts produced during 1935-39 and has been exceeded only in two years, 1943 and 1944.

2. The amount of feed, grain, grass and roughage, and the numbers of livestock now on hand will govern the total meat production during the next several months. Insofar as pork production is concerned farmers are much more concerned with support prices than they are with ceiling prices.

3. A general increase in livestock and meat ceilings is not likely to increase the number of animals marketed immediately. In fact, it might have the opposite effect, especially if it resulted in the holding back of beef cattle and veal calves for speculative purposes or for increased breeding. True, the number of cattle now on hand are at a high level but record numbers of cattle and calves are now being marketed and, in addition, we must remember that almost exactly one-half of those now on hand are dairy stock.

4. Slaughter outside of Federally inspected plants has been at a relatively high level so far in 1945. This either means that small operators are, after all, able to continue in the business or that black marketing has substantially increased. In this connection, there is one cold, hard fact that must be faced: that is, black marketing cannot be controlled by price ceiling manipulations since the demand for meat is far in excess of available supplies. This simply means that there must be an equitable sharing of the supplies that are available and that any effective approach to black marketing must be direct.

5. There is no indication at this time that the profits derived from the processing and handling of meat are retarding production and marketing of livestock.

6. The number of cattle on feed on January 1 was relatively high. There were on hand 4,173,000 as compared with 3,967,000 a year ago. In only two years, 1942 with 4,185,000 and 1943, with the all-time record of 4,445,000, has the present number been exceeded.

7. Any break in ceilings which would result in an increase in meat prices at retail should be avoided. Farmers and ranchers deserve fair prices but ceiling increases which could only lead to demands for the upward revisions of wages as well as demands for other price increases will work against the long run interest of farmers and ranchers as well as against the success of our immediate war effort.

## Brucellosis Vaccine Authorized for Adult Cattle

Biological supply houses that produce brucellosis vaccine under licenses issued by the Bureau of Animal Industry, U. S. Department of Agriculture, may now recommend the vaccine, under certain conditions, for adult animals as well as for calves.

The Bureau's recent official notice provides that licensed manufacturers may recommend the vaccine for the immunization of cattle over four months of age if not more than four months in pregnancy, and if use of the vaccine is not prohibited by the State. The purpose of limiting the use of the vaccine in animals advanced in pregnancy is to prevent possible adverse effect of the vaccine on the fetus. The second limitation is to prevent possible conflict with state laws governing the marketing of biological products.

## Antivivisectionists Active

During the past months bills to prohibit animal experimentation were introduced in various legislatures. Only in New York and in Congress did they attain a status of nuisances.

One of these bills passed the New York Senate but died in committee in the house with the adjournment of the legislature.

Congressman Lemke who disgraces North Dakota in the national House of Representatives has introduced a bill to ban experimentation on dogs and other animals in the District of Columbia.

The hate that antivivisectionists bear for humankind was never better shown than after the recent tragic accident in which a bull terrier killed the 21-month-old daughter of its owners by seizing the baby and shaking it until its neck was broken. To protect other children from a similar horrible fate, the owners decided to have the dog humanely killed. Whereupon numerous self-styled dog lovers deluged the bereaved parents by letter, telegram and telephone appeals and threats, for the purpose of saving the animal's life and

thus, in the opinion of the dog's owners, endangering other children.

At a time when every impulse of decent folk was to sympathize with the parents, the antivivisectionists held a field day for harassing them.

## B.A.I. First Bureau in Department of Agriculture

The work of the United States Department of Agriculture had its small beginnings in the Patent Office, then in the Department of State, during the 1830's. On July 4, 1836, the Patent Office became a separate unit and Henry Ellsworth became its Commissioner. He soon began, without special authorization or appropriation, to distribute plants and seeds of value to farmers, and to plead for the publication of agricultural statistics. In 1839 the Congress granted the Patent Office the right to expend $1,000 out of current income for agricultural purposes, the first such authorization ever extended.

The agricultural work of the Patent Office expanded rapidly, as did appropriations to carry it on, and soon the services of an agriculturist were required. Ultimately an agricultural section was set up in the Office and there was constant agitation for the creation of a Federal Department of Agriculture. In 1862 an agency to serve agriculture was created. It had bureau status and Isaac Newton, then in charge of Agricultural affairs in the Patent Office, became first Commissioner of Agriculture.

The bill creating this agency was signed May 15, 1862, by President Lincoln. On July 2, 1862, President Lincoln signed the Land-Grant College Act which endowed the colleges with 11,000,000 acres of public land.

The next step was the raising of the head of the agricultural agency to Cabinet rank. This also was done as the result of widespread public agitation. The bill passed the 50th Congress and became law February 13, 1889. President Harrison appointed Jeremiah M. Rusk Secretary and he assumed office March 7, 1889.

It had already become necessary to subdivide the work of the nascent Department into sections and divisions. But on May 29, 1884, an act was passed to prevent the spread of contagious diseases among cattle, and the first bureau was created. It was the Bureau of Animal Industry and was established in the Department to enforce the new law. This Bureau has now preserved its essential identity longer than any other line agency of the Department.—*The Federal Veterinarian*, 2:2, 1944.

## Indications for Penicillin

Cumulative clinical experience has demonstrated penicillin to be the most useful therapeutic agent available for treatment of: staphylococcic infections with and without bacteremia; clostridial infections including gas gangrene and malignant edema. Likewise, hemolytic streptococcic infections with bacteremia and serious local hemolytic streptococcic infections are most effectively treated with penicillin.

Penicillin is, also, the best therapeutic agent available for treatment of: anaerobic streptococcic infections including puerperal sepsis, and localized anaerobic streptococcic infections; pneumococcic infections of the meninges, pleura and endocardium, and sulfonamide-resistant pneumococcic pneumonia. Gonococcic infections are more effectively treated with penicillin than with other agents. Penicillin is the most effective therapeutic agent available for use in: anthrax, chronic pulmonary suppuration in which surgical treatment is contemplated, meningococcic infections failing to respond to sulfonamides, and bacterial endocarditis due to susceptible organisms. — Bul. *War Production Board, Therapeutic Notes*, Mch.-Apr. '45.

## Bovine Tuberculosis Declines 98 Per Cent

Federal meat inspection records, which give us a true picture of conditions, show that in 1916, the year before the national tuberculosis eradication campaign was started, 2.35% of all cattle slaughtered had tuberculous lesions as compared with 0.96% in 1908, increasing two-and-one-half times in the eight-year period. If nothing had been done, and if it had continued to increase at the same rate to the present time, today 50% of our cattle would be infected with the disease. But the situation was brought to the attention of legislative bodies and something *was* done. With adequate appropriations from the Congress, state legislatures and county boards, and with an efficient army of veterinarians ably directed by federal and state sanitary officials, tuberculin testing was done so thoroughly that by 1943 only 0.048% of all cattle slaughtered under federal inspection showed lesions and were retained for the disease—a reduction of 98% from the 1916 figure. The number of beef carcasses condemned has been reduced from 40,746 in 1917, or 0.44% of the total kill to 1,248 or 0.01% in 1943—also a reduction of 98%. In Chicago, the reductions have been 99% in each case.—*H. R. Smith*, General Manager, National Livestock Loss Prevention Board.

# Mules Carry on Over War Fronts' Rough Terrain

It takes a ten-mule team to pull a heavy Chinese howitzer many miles, over mountainous terrain on the Burma Road, on its way to the fighting at Yunnan, China.

Major Joseph L. Gridley, Bakersfield, Calif., joined the Chinese Combat Command in October, 1943, and took part in the offensive in Yunnan to open Stilwell (Ledo-Burma) Road.

Captain Richard A. Shea, Oklahoma City, after spending several months in the Yunnan campaign, proceeded to Tibet to purchase 10,000 horses for the Chinese Combat Command in the land of the Yaks, at an elevation of 12,000 feet.

Mules start the long difficult climb to Fifth Army front line troops in Italy, supplying them with everything from "B" rations to generators. Capt. W. V. Hornbaker, formerly of Green Bay, Wis., operated two veterinary hospitals for the 5th Army. Forty per cent of the wounded animals are returned to duty.

Many animals were obtained from the French and Italians. Before the war Italy imported many American mules, some of which are back with Americans now

Mules of the Mars Task Force led through a river that impeded progress in Bhamo, Burma. In the warfare that has characterized this area horses and mules are vital, for motor transportation is unable to get supplies over the steep pathless hills, rugged mountains and streams.

Major Homer Brown, Colorado Springs, Colo., entered the Army in 1941 and was first assigned to the 30th Vet. Gen. Hospital at Ft. Bliss, Texas. Later, he commanded the 2nd Vet. Co. Sep. He went to the CBI Theatre with the 19th Vet. Evac. Hosp. and proceeded to the Burma Road area.

*Photos Signal Corps, U. S. Army*

## With the Chinese Combat Command

Captains Frederick C. Cairns and John Sheehan, on duty with the Chinese Combat Command, U. S. Army, have been given the Chinese Grand Star of Honor for distinguished service rendered the Republic of China and the Chinese Army.

Captain Cairns entered the service in 1942 and was sent overseas in 1944. Prior to entering the Army the captain practiced at St. Johnsville, New York, after he was graduated from Cornell.

Captain Sheehan was graduated from the Washington State College and entered the service in 1943. His home is in Renton, Washington.

Major Burt Reinew, until recently captain, is engaged in a horse-purchasing mission with the Sino-American Bureau of the Chinese Combat Command. Before going overseas in 1943 Major Reinew attended the Medical Field Service School at Carlisle Barracks, Pa. The Major was graduated from the Alabama Polytechnic Institute and had a private practice at Paramus, N. J.

Major Leonard Krawitz (University of Pennsylvania) is in command of the veterinary personnel of the TIG (Traveling Instruction Group) of the Chinese Combat Command, composed of 20 Americans and six Chinese interpreters. Its mission is to teach the Chinese the methods of modern warfare, to distribute and assign American equipment and supplies to Chinese military units.

The 258 pack animals used by the TIG on the six hundred mile trek to the Burma border were Chinese ponies and small, tough little mules, with men and women coolie attendants. Pack animals are usually hired in China but these were bought. The TIG traveled with the pack animals over some of the worst terrain in the world in 52 days. They came through with the loss of only one pack load and one pack horse killed by a tiger at a noonday halt. Wild game is abundant and it is reported that "Leopard's meat is not so bad to eat."

✓ ✓ ✓ ✓

Captain Henry A. Bender, formerly of Canton, Ill., with the assistance of two enlisted men and 115 Chinese, is operating a modern blacksmith and veterinary station—the Tafa Vet Shop. The outfit follows the Chinese army of the south-west and keeps the animals fit in the mountainous region. Wiry little horses of the Himalayas predominate. The shop is so extensive that the animals of an entire Chinese division can be reshod in 2½ days. All equipment except anvils was constructed by the capable personnel of the outfit.

## Learning About Army Mules

An American remount station for the Italian Front has supplied 6,000 mules for the Fifth Army of which 5,000 are still in the service, according to a report of the field public relations service.

This remount station occupies 3,600 acres and normally contains about 500 horses, 1,000 mules and 2,000 pack animals—both horses and mules. The installation included, of course, a veterinary hospital, shoeing shops, dipping vats and quarters for the personnel in addition to stables, picket line, corrals, exercise plots and pastures.

Reclassified combat soldiers comprise 50% of the remount personnel. The case of Pfc. Olsen of Brooklyn is typical. He went through the African campaign and up to Naples with an ack ack outfit. Then after a physical examination was told he couldn't take it any more and was sent to the remount where he has already been kicked six times by mules.

Before he went into the Army all the animals he had seen were dogs, cats and the milkman's horse. Now he is learning about mules. Olsen says they are not the stupid animals people think they are. "The trouble with some people is, they just aren't smart enough to handle them."

This remount station was established in December, 1943, when the Fifth Army was fighting in the mountains before Casino and there was an urgent need for pack animals at the front. The farther the Army went the greater became the need for mules, and the harder the remount worked to supply them. Everyone thinks the mules have done a good job, but of course no Army has ever had enough draft animals and the Fifth Army on the Italian Front is not an exception.

✓ ✓ ✓ ✓

## Army Veterinary Service in Hawaii and Pacific War Areas

Army veterinarians, in cooperation with territorial officials, are doing an admirable job in keeping some 23 livestock diseases, present in other parts of the world, out of Hawaii and the United States.

There are approximately 23 serious animal diseases prevalent in various parts of the Asiatic-Pacific areas in particular and in the world in general which are not now present in the Territory of Hawaii, and we don't expect to get them here if we can help it.

Standing in front of a large map of the Pacific Ocean and Orient, Colonel Wayne O. Kester, Chief Veterinarian of the Army's Pacific Ocean Areas and also Chief Veterinarian for the Central Pacific Base Command, pointed

to the colored pins and small slips of paper listing the animal diseases on the islands and areas in his far-flung Commands.

### Disease Prevention

It is the job of Colonel Kester and the numerous veterinary officers and enlisted technicians of his service scattered from southern New Zealand to Iwo Jima and Hawaii to Okinawa to see that not only do those unwanted diseases stay out of the Territory of Hawaii and the United States, but also to do everything possible to eradicate them where they exist.

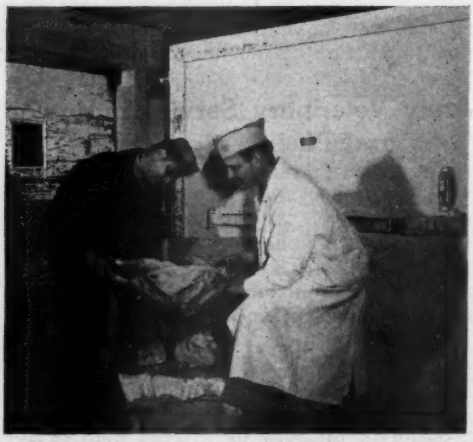
These scourges of animals include anthrax, encephalomyelitis, rabies, glanders, dourine, epizootic lymphangitis, surra, contagious bovine pleuropneumonia, foot-and-mouth disease, rinderpest, leishmaniasis, equine piroplasmosis, bovine piroplasmosis, canine piroplasmosis, psittacosis, pseudo-fowl pest, avian spirochaetosis, sporotrichosis, and distomiasis.

### Service of All Varieties

Veterinary officers and their enlisted assistants have and still are rendering professional service on thousands of animals including pack mules, horses, war dogs, signal corps pigeons, and government owned livestock. On Christmas Island, for example, the men of this branch of the service care for some two to three hundred animals on a farm operated by a veterinary officer for the past two years. Army veterinarians have also cared for thousands of animals on far-flung captured islands.

### Experts Sent Out

Specially qualified veterinary teams from medical laboratories are sent forward into new areas to assist Island Veterinarians in animal disease investigation and control. These men determine the presence or absence of disease among livestock in occupied areas that may affect the health of troops, local food production or quarantine procedures, as soon as possible so that protective measures may be taken.



*Signal Corps, U. S. Army*

**Turkeys for Christmas dinner for the troops on the islands were carefully inspected in Hawaii by Captain Edward H. von Glan, Spokane, Washington and S/Sgt. Wray Stone of the veterinary corps**

Here in the Territory the veterinarians are frequently called on to care for all varieties, shapes and sizes of service pets, including a lion cub, a monkey and a wildcat—all of which are now in quarantine in Honolulu.

### Food Biggest Job

Care of animals constitutes only a small portion of the work currently being done by the veterinarians, for the inspection of foodstuffs is by far the most time consuming and exacting in Pacific Ocean Areas. Technicians working under veterinary officers are stationed at approximately 50 cold storage plants and ration dumps in the Central Pacific Base Command alone.

Another 65 are engaged as veterinary inspectors in food producing establishments and still others are stationed in reclamation centers where damaged and spoiling food is handled under their technical supervision. A few work along the waterfront inspecting ships as they load and unload. Other Base Commands in Pacific Ocean Areas operate in a similar manner.

A large inspection force of veterinary officers and men is also stationed throughout New Zealand where millions of pounds of foods of animal origin are inspected and procured for our armed forces each month.

As an example of the efficiency with which the veterinary food inspectors work, records show that only an approximate one-fourth of one percent of all foods of animal origin received in the Hawaiian area since the start of the war has been condemned as unfit for human consumption. That figure is far below even the peace time expectation. Spoilage necessarily has been higher in wet tropical and battle areas. However, there have been no reported outbreaks of food poisoning or sickness due to troops having been issued spoiled or unsound foods.

As if the duties already outlined aren't enough, Colonel Kester and his staff are charged with keeping fully oriented on the local agricultural industry, the dairy situation, livestock feed shortages and local veterinary problems. Topped by close cooperation with territorial, federal and other service officials, the army's veterinary program, though little publicized, becomes one of the most valuable and worthwhile of the war.—Douglas Barton in *Hawaii Farm and Home.*

## Vaccinate Young Puppies

The disease which causes the death of more dogs than any other, is distemper. It is known in all countries of the world and all parts of the United States. It appears at all seasons of the year, probably more prevalent during the late fall, winter and early spring. Serums and the new sulfa drugs are very effective in the treatment of this disease and a much higher percentage of dogs are saved now than in the past. If the dog is vaccinated before exposure to distemper, it is possible to establish permanent immunity. It is almost impossible to raise dogs in a city without having them become exposed to distemper, so it is extremely essential that they be vaccinated while puppies. Then the owner can be assured that his dog will not suffer from this dreaded disease.—*Wayne H. Riser,* Annual Meeting Illinois Veterinary Medical Association.

## Westchester County Rabies Forum

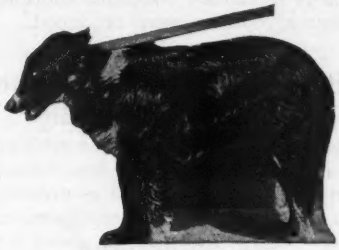
On Wednesday evening, January 17, the Westchester Veterinary Medical Society conducted a public forum on rabies at White Plains, New York. The purpose of this forum was better to acquaint the general public, especially physicians and persons active in animal protective societies, with rabies and the various problems of its control and eradication.

Mr. T. J. Ahearn, superintendent of schools of Mamaroneck, was the moderator. Health officials of the state and city of New York discussed the broad public health aspects of dog control, rabies and the possibility of eradicating this disease through periodic inoculations with anti-rabic vaccine; also various atypical cases of rabies in dogs and persons. Many specific instances of rabies having been contracted through neglect of bites were cited.

The forum was well attended and written questions from the floor, covering all the aspects of this problem were discussed and answered.

The Westchester Veterinary Medical Society was organized as an informal club of practitioners by Doctor, now Colonel, O. E. McKim of Port Chester, in order to achieve greater cooperation among veterinary practitioners in the County in the handling of various questions and problems arising.

During the first few years of this loose organization, this group was successful in inducing several humane societies to cease their efforts to establish so-called clinics for dogs. It was shown that the veterinary practitioners of the district were willing at all times to treat pets belonging to indigent people and that clinics established, no matter for what humanitarian purposes, would develop into society-operated practices that could be of no special value to the animal owner and of detriment to the veterinary service of the county. This club was also instrumental in blocking the efforts of a group in Yonkers to have the City build a palatial dog pound costing over $40,000, the main feature of which was to be a club room for the local animal societies and a ward for the treatment of



Dumb rabies in a dog

animals notwithstanding there were four veterinary hospitals in Yonkers.

Another result of the closer cooperation among veterinarians in Westchester County was the total elimination of veterinary advertisements from the telephone books.

During the past year this Society has been instrumental in getting the cooperation of kennel clubs conducting shows in Westchester County to have the veterinary supervision of these shows under the control of this Society, which appoints several of its members to attend each show without undue publicity being given to any individual. The rabies forum mentioned in the foregoing is another example of its activities. The membership includes every practitioner in Westchester County and, whenever a veterinarian enters practice in the County, he is invited to become a member of this organization and share in its benefits.

It is felt that local organizations of this character need not stress professional or scientific papers at their meetings, as these matters are better taken care of by larger associations. However, there is a wide field of usefulness in closely cooperating local organizations and the Westchester Veterinary Medical Society feels that it is pioneering in this field and would like to get reactions from veterinary publications, organizations and individuals as to this type of organization and activity among veterinarians.

S. M. Appleby
526 Sawmill River Road, Secretary
Yonkers 2, N. Y.

## Ascarids in Swine

Parasitologists of the U. S. Bureau of Animal Industry have found that a small dose of sodium fluoride—now used externally for chicken lice—is promising for removing ascarids from swine. Results indicate that not more than 1% of sodium fluoride mixed in dry feed for one day is the proper dosage. Treatments removed 96 to 100% of the round worms and some of other species. The dose indicated above was not toxic to six different species of farm animals, including dogs and chickens. When hogs received 4% sodium fluoride in the feed toxic symptoms were produced.

## Calf's Udder Is Index to Future Production Capacity

In view of the fact that 5 or 6 million heifer calves must now be saved and raised each year in order to maintain the present dairy cow population in the United States and the fact that nearly one-third, or about 2 million head, turn out to be unprofitable milk cows, the economic importance of discarding the potentially low producers early in life is obvious. The cost of raising a heifer calf to milking age is about $100.

Studies begun by the Bureau of Dairy Industry a number of years ago now show promise of providing dairy farmers with a method of judging the future milk-producing possibilities of young heifer calves.

The method is the outgrowth of an investigation to determine the significance of advanced or retarded mammary-gland development at any given age in heifer calves, as an indication of their milk-producing capacity at maturity. Each year since the study began the udders of all heifer calves in the Bureau's herd at Beltsville have been examined periodically by palpation at ages ranging from 1 to 18 months.

Many of the calves graded for mammary-gland development have now grown to milking age. A recent comparison of their production records with the grades assigned to them as calves showed that those with retarded development produced on the average some 2,500 to 4,000 pounds less milk per year than those that were advanced in mammary development at the same age. The grades assigned at four months of age were found to be more indicative of potential producing ability than those assigned at any other age.

The evaluation of mammary-gland development in calves is not difficult; with very little practice any dairyman can become proficient in classifying the calves in a herd or group into three classes—advanced, medium, or retarded. These classes may be designated as A, B, and C; good, medium, and poor; high, medium, and low; or in any other way. By examining the calves as they reach the age of four months and keeping a record of the class in which each is placed, it is possible, when they come into lactation, to determine the reliability of the method for culling out the inferior individuals. It is necessary, of course, first of all to become familiar with the exact stage and size of glandular formation to be expected in a calf at four months of age.—Ann. Rept. Chief, Bureau Dairy Industry, U.S.D.A.

Because it was persistently wet and chilly in the corn belt during the late fall and early winter and corn had to be shucked and cribbed in a moisture content too high for long storage, there is a probability that a great deal of the grain will spoil and mold unless, before warm weather, it is converted into meat.

## Pasture for Poultry

When birds are spread over a large area in pastures, the sanitation problem is greatly diminished. In addition, there is a saving of up to 15% or more in feed costs. Good pastures, as a rule, produce healthier pullets and isolation in brooding and rearing is possible.

Several experiment stations, after careful testing, have recommended certain combinations of grass for the particular area for pastures for poultry. A few of these[1] are listed:

| | |
|---|---|
| **Maryland** (per acre on fertile soils) | |
| Kentucky bluegrass | 8 lbs. |
| Timothy | 8 lbs. |
| Alsike clover | 3 lbs. |
| Ladino clover | 2 lbs. |
| **Pennsylvania** | |
| Kentucky bluegrass | 6 lbs. |
| Perennial ryegrass | 10 lbs. |
| Canada bluegrass | 4 lbs. |
| Redtop | 2 lbs. |
| Ladino clover | 2 lbs. |
| White clover | 1 lb. |
| **Ohio** | |
| Ladino clover | 2½ lbs. |
| Domestic rye grass (seeded with clover in spring) | 5 lbs. |
| Kentucky bluegrass (seeded in fall) | 6 lbs. |
| Timothy (2 lbs. in fall) | 4 lbs. |
| **New York** | |
| Kentucky bluegrass | 12 lbs. |
| Ladino clover | 2 lbs. |

Sow without a nurse crop, but if nurse crop is used, harvest early.

After the second season ladino, which is a hardy plant, often predominates in the pasture.

[1] *Everybody's Poultry Mag.*, March, 1945.

# Reconversion For Our Profession

By E. T. BAKER
Moscow, Idaho

IN THESE days of plans for reconversion among industries, would it not be in order for our own profession to study the subject so rarely discussed, "How a Veterinarian Can Earn a Living."

Having attended many state association meetings from Coast to Coast during the past 25 years, I have been struck by the eagerness of men to learn something about other parts of the country.

"I have a brother in Twin Falls, Idaho," said one Buckeye practitioner to me at Columbus, Ohio, several years ago, "Do you happen to know him?"

"Don't believe I do," I replied. "You see, Twin Falls is only about 450 miles from my home in Moscow."

"Are you kiddin'?" he exclaimed.

"No," I replied, "Possibly you do not realize that Idaho is twice as big as Ohio. It is nearly 1100 miles from the southeast corner to the northwest line by auto. Why, we have to go through Washington and Oregon, a distance of 520 miles by rail, to get to our state capital, Boise (boy-see). That's a hundred miles farther than it is from here across Indiana and Illinois to St. Louis. Even Montana is over 800 miles wide, a distance nearly as great as from Chicago to New York and from my home in north Idaho to Los Angeles it is just 1510 miles!"

Another man asked me at Galesburg, Illinois: "You don't have much stock out your way except sheep, I suppose."

"On the contrary," I answered, "dairying is a leading industry with us, and I treat more than a hundred cases of milk fever a year."

Now, I am just as ignorant of conditions in Vermont or Georgia as men in those states are of Idaho or California. We are kept so busy in our own little bailiwicks that we have little time to think of what is going on in other parts of our country.

### Different Farming Conditions

Another thing, states are often divided by physical barriers into almost two different countries. For example, north Idaho is non-irrigated, with vast forests, rugged canyons and areas of good farming land, where cereal grains, peas, beans, alfalfa and livestock are produced. One of the great mining regions of this nation is in one section. It is mountainous, rolling and scenic, while south Idaho is mostly level with irrigated tracts which produce vast amounts of sugar beets, alfalfa, honey, sheep and other livestock. Some parts are so arid it takes three jackrabbits to raise one young one, while others are very rich and productive. Turkeys are raised by the thousand and "Idaho potatoes" are famous. The Snake River is the Nile of that part of the state, with several huge dams and reservoirs.

The eastern sections of Washington and Oregon are dry and fairly level, with a few forests and canyons, but the western parts bordering on the coast are radically different. Here, cattle graze the year around and the climate is quite different from the eastern parts, from which they are divided by the Cascade Mountains. It is much like my native state of Pennsylvania, which is divided into the eastern and western parts.

"I have hay fever so bad I must move away from here," writes one practitioner, "and I was wondering if you know of any climate out west good for this ailment."

Another inquires: "My wife has arthritis so bad our doctor has recommended a high, dry climate. Do you know of any place where we could locate?"

Others write me for information on the west, as they want to move for personal or financial reasons. This moving from one place to another, combined with retirements, deaths and disabilities, certainly offers a great opportunity to our national association to disseminate information as to desirable locations for practice, particularly now.

### Facts and Figures (There May Be a Difference)

There are 3,072 counties in our 48 states, with, according to the 1940 census, about 9,300 towns and cities having a population of 1,000 or more. Of course, war conditions have "messed up" our population somewhat but let us assume there are about 10,000 locations where one or more veterinarians can make a comfortable living.

There are some practitioners making a good living in towns under a thousand but these are the exception.

The character and type of family also plays a large part in success or failure, for one family will prosper on $2,500 a year while another will go broke on $5,000.

However, we will not take into consideration the personal equation but devote more time on the financial opportunities of the location. Will it support one or more practitioners in good times and bad?

Let us assume there are about 15,000 members of our profession divided in the various branches such as Federal, state, college, commercial, army, general and small animal practice and miscellaneous occupations. These may also be divided into age classifications, ranging from 25 to 70.

### The Simple Life

Age, however, is a variable factor for many are old at 45 and others young at 65. I used to think a man of 60 was a first cousin to Methuselah. I don't think so now. One's value

CLASSMATES
T. J. Foster, Monticello, Ill. and E. T. Baker, Moscow, Idaho. Ohio State '09. Author at right

to his profession grows in length of years, so long as he is not afflicted with ossification or mollities of the encephalon and is physically fit.

The life one leads plays an important part. Some devote all their time to recreation—and go broke; others spend all their time trying to make more money—and lose their health; a few take the middle road, live as they go along and still accumulate a competence for a comfortable old age.

Pertinent to these factors, I think of two sayings of Solomon:

"Discretion shall preserve thee, understanding shall keep thee," and

"Why shouldest thou die before thy time?"

One of the tragedies of old age, it seems to me, is to be laid on the shelf with a lifetime of rich experience in professional lore absolutely wasted. I am a great believer in older persons retiring from active work at a reasonable age or when they become incapacitated, in order to allow the younger generation to take over. One crop of grain utilizes the land for only one season. However, these older persons should have some place in our economic structure and should, at least, be allowed to keep their minds busy.

I like to think of the story Irvin Cobb used to tell about the farm house he passed in Missouri and heard a terrible commotion. He stopped and asked a very old man sitting on the front porch:

"What's all that ruckus about?"

"Oh, that's jest Pa puttin' Grandpa to bed, an' he don't wanta go."

### A Suggested Remedy

Now, the writer, being only a simple-minded practitioner, living out in a sparsely-populated section of our great country, is not supposed to know much and his personal influence is, therefore, practically non-existent. But, I believe that our national association, with the help of men from every state and section of our nation, should publish a small volume, which might be christened "The Veterinary Blue Book." It could contain, for example, the following and much more information:

MINNEBRASKA

A north central state.
*Area*—49,640 sq. miles.
*Population*—2,146,023.
*Counties*—120.
*Cities and towns over 1,000*—221.
*Agricultural resources*—5,250,133 acres arable land, suitable for grain and live stock raising on small diversified farms.
*Livestock—Numbers of:*
Horses, Etc.—
Cattle—
Hogs—
Sheep—
Goats—
Small animals—
Poultry—
Misc., Fox and mink farms, etc.—
*Value of Livestock*—$310,983,766.
*Farms*—174,321, with following acreages:
1 to 5 acres—
6 to 10 acres—
11 to 40 acres—
41 to 80 acres—
81 to 120 acres—
121 to 160 acres—
161 to 240 acres—
Over 241 acres—
*Climate*—Winter, usually from November to March, rather severe—often dropping to —20° F., with heavy snowfall during January and February.
Spring, wet, sometimes blustery and erratic.
Summer, hot, humid but pleasant at times.
Autumn, ideal; agreeable Indian summers.
*Topography*—About 1500 feet above sea level,

with many hills but no mountains. Land generally rolling.

Northern section most level; central area heavily wooded, with small farm flocks of sheep and goats and most farms woodland and range stock; southern section more devoted to diversified farming, being near to most of the large cities. Much truck gardening.

### Vital Information

*Type of farmer*—Typical American, many Scandinavian; honest, frugal; great majority pay bills promptly.

*Roads*—Average to good; most country roads sanded or rocked and passable almost any time of the year with mud tires or chains.

*Recreational Opportunities* — Many rivers, lakes, woods and rolling brush lands for hunting and fishing. Usual fraternal and religious organizations.

*Living costs*—Average to high in large cities; fairly low in small towns, with rents and property values reasonable in the latter. Taxes—well, sure.

*Train and bus service.*—Mostly good in all sections.

*Branch Supply Depots*—Emergency veterinary supplies can be obtained in a few hours.

The foregoing general information will enable him to select the state of his choice, or perhaps two or three states in either or any of which he could be happy. Now he wants particulars.

*Towns with adequate veterinary service:*
Allen City.
Pine Ridge, etc.

*Towns with no veterinarians:*
Goose Creek.
Lake City, etc.

*Locations for small animal practitioners:*
Bark Center.
Maltese Corners, etc.

For more detailed information, write Mayor or make personal visit.

### Professional Problems

*County Agents*—Keep in their proper places.

*College relations*—Cordial and ethical. They do not claim, that next to God, they are the practitioners' best friends, and then teach every farm boy "how to use th' needle."

*State Veterinarian*—Strictly a political plum for the most deserving; appointed by the governor. Appointed deputies will do well not to rely upon political favor.

*Federal Officials*—Helpful and cooperating.

*Types of Practice*—Mostly general or small animal. Some areas devoted chiefly to dairying.

*Kind of Practice*—Usual run.

*Special work*—State deputies paid per diem; some towns have meat inspection or milk inspection or both, and more should have.

*Competition*—Newcomers will do well to refrain from unethical practices, for the news soon gets around over the state and "shyster veterinarians" never live it down.

There may be said to be two kinds of competition:

1. Legitimate, such as found in Buffalo Hump, a prosperous little town of 7,500, surrounded by a good farming community. Doctors A and B are located here and both have plenty of practice; so they get along well. There is no price cutting; both are in comfortable circumstances. Each veterinarian has his own clientele and takes care of it.

2. Ruinous, such as occurred at Hog Meadows, a county seat of some 4,500 souls, surrounded by a marginal agricultural section where most of the farmers are only two jumps ahead of their taxes. Here, the two veterinarians, Doctors C and D get along about as amicably as France and Germany. They cut prices, they work for practically nothing,

*Signal Corps, U. S. Army*

**Many veterinarians returning from the Army would find the "Blue Book" useful**

spend most of their spare time vilifying each other, and their clients believe what each says about the other. There is only enough work for one man—for two it's a tragedy.

However, only 60 miles away at Pike's Corners, another county seat, with a bunch of sturdy, frugal farmers and stock raisers, there is no graduate just a handy man.

*Necessary Income*—Those of us who have been in the game for some time know about what to expect in the way of expenses. Too many men make the mistake of thinking about their gross instead of their net income.

The higher the gross income, the higher the expenses, the more wear and tear on equipment and, also, on the health of the individual. With income taxes what they are, a person is foolish to ruin his health just to make a few more dollars per year.

A druggist, with whom we have done busi-

ness for nearly 30 years, tells us he figures on a 23% outlay per year for expenses, bad debts, etc.

Probably, a $5,000 gross income is about equal to a $3,000 salary.

### Summary

Suppose Captain John Smith of the Veterinary Corps returns to the States and to civilian life after three years abroad. He desires to locate in our mythical state, for his best girl lives at Popeye, Minnebraska and they both like that section. However, Popeye is served by a competent practitioner and there is work enough for only one man, so Captain Smith looks around.

He notes in his "Blue Book," that Fannyville, 80 miles to the north, is without a practitioner, so he and his fiancée drop in to look the burg over. They decide to locate, and make arrangements to rent a comfortable house on East Magnolia street. They then return to Popeye, get married, move into their new home and begin their journey down (or is it up) the highway of life. It is rather strange and lonely at first, but shortly they have made new friends, and soon they become an integral part of the community.

They have one or more children and go through the various tragedies and comedies of everyday life—soon they are middle-aged and, before they realize it, they are known as "Old Doc" and the "Old Lady."

Then, one day, along about 1980, old Doc lies down on the davenport, for he has been feeling tired lately, and his heart has been missing a beat now and then but, being busy with other people's troubles, he never pays any attention to his own for he has always been healthy. The startled family summon the physician but, by the time the latter arrives, "Old Doc's" heart has stopped beating.

Then, a new graduate looks in the Blue Book supplement and sees where Fannyville is without a veterinarian so he and his bride make their nest and start in where Old Doc and the Old Lady left off.

And so life goes on in a constant procession within our profession. The Blue Book should aid greatly in this eternal shuffling of locations and act much like rationing is supposed to act: Distribute the men and equalize them in new locations without crowding one and starving another.

Maybe such a plan wouldn't solve the problem; perhaps it's loaded with shortcomings, but it doesn't have to be very good to beat our present planless distribution of veterinary service, which is much like the old maid's breath of which it was said, "Anything will help some."

## Excerpts from Annual Report to the Montana Livestock Sanitary Board for 1944

We again desire to call to the attention of the legislative assembly and the livestock industry the absolute necessity for adequate veterinary service to protect our industry from the ravages of disease. We are a producing state and in order to keep open markets for our livestock they must be maintined in good health. Disease can quickly ruin any livestock industry. There are not enough veterinarians in Montana to give adequate veterinary service. If this is not remedied, sooner or later the livestock industry will sustain serious loss which will be reflected directly or indirectly to all industries in the State.

There are many districts in Montana which do not have the services of a graduate veterinarian. In most of these sections it is doubtful if a veterinarian could make a reasonable living without receiving support from the Livestock Sanitary Board. In outlying districts distances are too great for ranchers to employ a veterinarian who might have to travel 100 or 200 miles out to a ranch for ordinary veterinary service. A veterinarian will not locate in such an area without assistance from the Livestock Sanitary Board. If trained veterinarians are not strategically located throughout the State it is possible that a dangerous disease may get started, which could cost the livestock industry many hundreds of thousands of dollars.

We again appeal to the legislative assembly to review the work of this Department very carefully and to value the protection it gives to the livestock industry and the milk consuming and meat consuming public. It is respectfully requested that sufficient funds be appropriated to this Department to employ returning veterinarians who have been in the armed forces, so that they may locate in outlying areas and receive a part-time fee for supervising disease prevention and milk production and distribution in these districts.

.....

It is a responsibility of this Board to provide veterinary service for the prevention, control and eradication of livestock diseases including poultry diseases, to supervise the production and distribution of fluid milk in the entire State, to blood test and tuberculin test dairy cattle annually, to act as the stallion registration board, to quarantine and reinspect all sheep importations and to issue quarantines for all livestock found diseased in the State and to pay indemnity for condemned animals.

—*W. J. Butler*, State Veterinary Surgeon.

# Bovine Mastitis*

By R. A. HENDERSHOTT**
Trenton, New Jersey

PERHAPS we should define what we mean by mastitis. It seems to me, as I read articles in the professional and lay papers as well as those which are quoted in the advertisements for various chemotherapeutic agents that, perhaps, too many of us are becoming confused in our thinking. Too often we assume inflammation to be present when we encounter one of the possible bacterial offenders present in the secretion of the udder.

What do we mean by mastitis? What is it? When is it present? The word mastitis simply means an inflammation of the mammary gland.

Let us go back to fundamentals—let's say we return to the classroom to a course in general pathology.

What are the cardinal symptoms or manifestations of any inflammation? All recall the words calor, rubor, tumor and dolor—heat, redness (or congestion), swelling and pain. These, the pathologist taught us, are present in true inflammation, whether it be in the lung, liver, spleen or udder. Today when we glibly speak of mastitis do we have these four cardinal principles in mind? I think you will agree that often we have gone far afield in our use of the term mastitis.

Often of late we use the term mastitis when we have evidence only of the presence of microorganisms in the secretion which research has indicated are commonly encountered in true inflammations of the gland.

I think we have a very striking correlation in our own makeup. Many of us here today harbor in our nose and throat microorganisms commonly responsible for inflammation of the nose and throat, but only periodically do we exhibit symptoms of rhinitis and pharyngitis. True, occasionally we encounter people afflicted with an acute inflammation of the nose and throat and we may, after exposure to them, develop a similar condition ourselves. Then, too, we have experienced a bad cold following undue exposure to the elements or through lowered resistance from some other cause. So too, many udders harbor microorganisms which can, and on occasion do, multiply and result in true inflammation of the gland.

What actually do we find in our dairy herds?

1. We encounter true mastitis in which there is an alteration of the milk secretion evidenced by increase, in the milk, of the constituents of the blood. For example, lecucocytes which, as you know, are always called forth in any inflammatory process. There may be, also, an increase in chlorides and at times we find flakes, clots or pus.

2. We have those glands in which such organisms as *Streptococcus agalactiae, str. dysgalactiae, str. uberis, Staphylococcus aureas* and *albus* or coliform organisms, commonly associated with mastitis are present in the secretion without detectable alteration in the chemical composition of the milk.

3. We encounter mammary glands in which there is an increase in connective tissue—induration, which simply means that the gland has suffered inflammatory insults in the past.

4. We may have, too, all conceivable combinations of the above mentioned conditions.

Unfortunately we have, in too many of our dairy herds, some of each of these conditions or a combination of conditions and, generally speaking, we are too prone to gloss over them and simply use the term mastitis for all. However, in any control program, we should keep these groups in mind if we expect to be successful in combatting or controlling mastitis.

In a control program, it is important to identify udders that are harboring microorganisms commonly responsible for mastitis and to manage these carriers in such a way as to decrease the opportunity for the spread of infection to other animals in the herd.

It is likewise important that we recognize the amount of damage occasioned in the secreting gland through previous attacks of mastitis and determine whether or not it is economically sound to permit such cases to remain in the barn. So too, if my thinking is straight with regard to infectious sore throat, it is advisable to isolate, if possible, all cases of active inflammation of infectious origin among caretakers to protect members of the herd from these infectious agents which probably have increased in virulence. Physicians have had little success in inducing persons with acute attacks of rhinitis, sore throat and colds to stay in bed for their own protection. Perhaps we can be more successful in keeping them out of the cowbarn for the protection of the cows.

What are the causes of mastitis? The more I study inflammation of the mammary gland

*Presented at the 63rd Annual Meeting of the Illinois Veterinary Medical Association, Springfield, Jan. 18-19, 1945.
**Chief of the Bureau of Animal Industry, New Jersey Department of Agriculture.

the more I am inclined to the view that trauma is by far the most common, if not the only, cause of mastitis.

The mammary gland of the dairy cow has been increased enormously in both size and productive capacity through selection. We need only observe the udder of beef animals and compare them with those of the present day dairy animal to appreciate how far the latter has departed from the structure nature intended the cow to have. It is large and has moved out of the protection of the pubic region to a most exposed position between the pelvic limbs. Here, because of its size, especially when full, it is subjected to pressure of the legs at each step. It often is dragged across the high door sills of barns, the edge of the bed, especially is this true in those barns with deep gutters and short beds where the gland forcibly comes into contact with the floor whenever the animal slips off the platform. Today's pendulous gland and long teats are commonly stepped upon causing wounds which invite invasion or set the stage for multiplication of organisms present in the gland. Nor is this all, when the animal is resting some part of the gland is usually compressed more or less by the weight of the body, thus interfering and instead of resting on the other limb as nature intended more often contacts the floor, and is exposed to drastic changes in temperature.

Our method of milking has had much to do with traumatizing the gland. Prolonged milking after the gland is emptied injures the single layer of columnar epithelial lining of the teats and prepares the tissue for invasion by pathogenic organisms.

A recent survey, reported by Professor Peterson of Minnesota indicates that the average length of time machines are left on cows is 9¾ mintues whereas practically all cows are completely milked in three to four minutes.

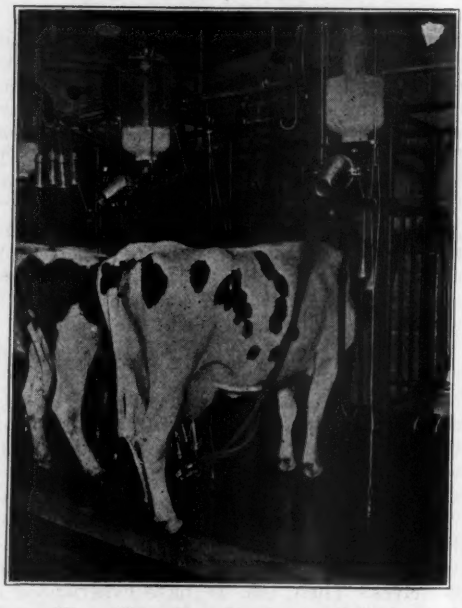
A recent report by Murphy, of the New Jersey Agricultural Experiment Station, definitely states that a tendency to mastitis is present in certain families. The two families studied No. 283 and No. 247, are housed in the same barn and are served by one set of attendants. Family 283 consisting of the dam, three daughters and two granddaughters, was found to be infected with streptococci during 24%, and with staphylococci during 39.3% of their combined lactation periods. The other family, 247, composed of the dam, four daughters and two granddaughters, was infected with streptococci during 0.9% and with staphylococci during 10.9% of its combined lactation periods. The incidence of actual inflammation of the udders in these two families judged by physical examination, leucocyte counts and strip cup examinations also paralleled the infection histories.

Another investigator, Dr. R. B. Little, has for years suggested hereditary anatomical faults of the teat sphincters, as a factor in the tendency to inflammation of the gland. More work is needed on this phase of the mastitis study to correctly evaluate the part heredity may play.

### Machine Milking Versus Hand Milking as a Factor

We hear many statements supporting each of these two methods of milking. Some veterinarians insist that hand milking will control the disease, still others advance their claim that machine milking is scientifically sound and will materially reduce the infection rate in the barn.

It is quite true, I believe, that no two hand



In machine milking if proper vacuum is maintained trauma should not occur

milkers milk alike. Some exert greater pressure than others and often, especially with the type of labor available today, hand milkers traumatize the teats to a considerable degree.

With machine milking if the proper vacuum is maintained, approximately 15 inches of mercury vacuum, trauma need not occur, if the gland is prepared for milking and the cows milked out rapidly, say in three to four

minutes. It would seem that through mechanical milking we should have more uniform milking and less damage to the udder. In my own experience I have seen herds in which the incidence of mastitis was lessened when machines were introduced into the barn. It is neither the hands nor the machine that is at fault, but the head that directs them.

### The Influence of Teat Tubes

Undoubtedly the injudicious use of teat tubes, teat dilators and therapeutic needles offer a great opportunity to traumatize the lining of the teat canal and to introduce infection.

How many times have you men observed a farmer moisten an instrument used for teat dilation in his mouth and then insert it through the teat meatus? How often are the teats properly cleansed and sterilized before the insertion of udder cannulas and are we always certain the cannulas are sterile before proceeding with treatment?

### The Effect of Feed

This is a question that is frequently raised. In my country, we often hear the story that high protein feeds are directly responsible for mastitis. In the corn belt I suspect that this worthy grain is charged by some as being responsible; likewise in the south cottonseed meal is specifically the culprit. No one questions the wisdom of reducing the concentrates when a cow is suffering from acute mastitis nor the benefit derived from that procedure. Today few remain among us who believe that feeding *per se* is responsible for mastitis.

### Cow Psychology and Its Effect

During recent years Professor Peterson has conducted considerable research work on the effect of the secretion of ductless glands on milk production. One principle, oxytocin, a product of the posterior lobe of the pituitary, contracts the muscle fibers in the milk tubules, the other, adrenalin (epinephrine), a product of the suprarenals has an inhibitory effect. The production of oxytocin is stimulated by the presence of the nursing calf, the clanking of milking utensils, the washing of the udder, in fact the carrying on of any procedure which the cow associates with the milking routine.

Adrenalin, thrown into the blood stream whenever the animal is startled or experiences fear, is responsible for the failure of animals to "let down" their milk. The voice of a stranger in the barn may be responsible for the failure to let down the milk. In this connection we had an interesting experience in one of our penal institutions for women. In this herd women do all of the work in the barn. We found that whenever our veterinarians collected blood samples there was a marked decrease in milk production. The presence of a man in the barn had an adverse effect on production, the cows became excited. In an endeavor to reduce this excitement resulting from strangers in the barn we advocate installation of radios in our cow barns. They accustom the animals to different voices. We think they are beneficial. Radios also aid in labor morale, especially during a world series. Kindness to animals pays big dividends on a dairy farm, hence contented employees as well as contented cows are an advantage.

### Bacterial Invaders Involved

The most common organism found in the udder is the *Streptococcus agalactiae*. It has been incriminated as responsible for 80 to 90% of streptococcal infections of the udder. Next in order probably should be mentioned *Staphylococcus aureus* and *Staph. albus, Str. dysgalactiae, Str. uberis* and then the coliform organisms.

The fact, however, that the milk contains these microorganisms does not mean the animal has mastitis. It does mean that the udder has been invaded by these organisms which await the opportunity presented by trauma, a lowered resistance of the body from whatever cause, to multiply and cause acute inflammation of the gland.

### Diagnosis

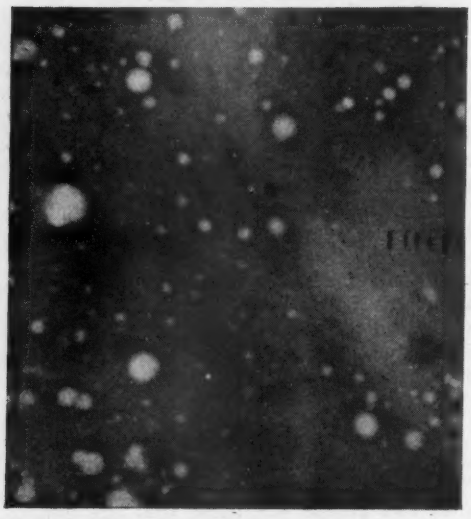
Various methods have been advanced for determining the state of health of the udder. These methods can conveniently be divided into two groups (1) those that are applied in the barn and (2) those that require laboratory examination.

Barn tests consist of (a) the strip cup which is valuable in detecting flakes, clots, pus and thin or thick milk. (b) The Brom thymol blue test, which, as you know consists of the addition of the reagent to a sample of milk—the color reaction resulting indicating the acid or alkaline condition of the milk. It fails as a complete test because normally changes occur in the reaction of milk both in early and late lactation. The Brom thymol blue test is of value when associated with other barn tests. (c) Physical examination or determination of the condition of the udder by palpation. This method is of particular value in determining the extent of the damage to the udder by present and past attacks of inflammation.

None of these barn tests are able to identify for us the organisms that may be present. They are, nevertheless, valuable aids and

should be employed in any mastitis control program.

2. Two popular laboratory tests are in use. (a) The Hotis test. This test consists of the addition of 0.5cc. of a 1:500 dilution of Brom cresol purple to a sample of milk aseptically collected. The reagent, somewhat like the Brom thymol blue, is a good indicator of acid or alkaline reaction of the milk. Following incubation at 37°C. it is possible to identify *Str. agalactiae* and *uberis, Esch. coli,* and *Staph. aureus* and *albus*. This test is probably the most practical critical test available for use in a general control program. Doubtful samples can be examined microscopically or



**The microscopic appearance of high-grade milk produced by a cow free from udder infection following treatment and recovery**

plated on ox blood agar for cultural examination.

(b) The stained film examination, which consists of making a film of milk on a 1x3 glass slide, staining the film and examining it under the oil immersion objective. This method indicates whether organisms are present in the sample, whether they are staphylococci, streptococci or bacilli; also the presence or absence of leucocytes. It fails to differentiate the type of streptococci or staphylococci. It is easy to apply as far as technic is concerned. It is time consuming as a regulatory method and, as stated, fails to identify the various organisms present. It serves as a guide as to whether or not inflammation is present.

In practice we find the Hotis test is better suited for a state control program, than the stained film examination.

### Control and Treatment

Obviously to be successful, any control, treatment and prevention of mastitis must be preceded by an accurate diagnosis and satisfactory evaluation of all factors which enter into the dairy operation.

The following measures are necessary: First identification of infection in the herd. This is accomplished by a searching bacteriologic examination of the samples of milk from each lactating animal in the herd. Hotis test, stained film examination and cultural tests being employed as needed.

2. Stanchion the animals in the barn in accord with the bacteriological finding.

3. Examine by inspection and palpation, the udder of each animal in the barn to determine the amount of damage that has resulted from previous inflammations of the gland. Where the secreting tissue of any cow has been replaced by connective tissue (induration) sufficient to interfere with economic production of milk she should be consigned to slaughter immediately.

4. We believe that animals, even those known to be shedding organisms in the milk, if producing milk that is not changed too greatly in its chemical composition should be left untreated until near the end of lactation or in the dry period.

5. Acute cases of mastitis should be treated. In treating these cases the choice of chemotherapeutic agent will be dependent upon the etiological agent responsible. Generally speaking hot applications to the udder are beneficial. Reduction of intake of concentrates, frequent milking out of the affected gland, oral administration of sulfanilamide to those cases running a temperature of 104°F. or higher is beneficial. Administer one grain per pound of body weight the first day, 2/3 grain the second day and 1/3 grain the third day.

6. In our work with subclinical cases in institutional herds the choice of therapy is left to the judgment of the local veterinarian employed by the institution. It is required that all treatment be reported to my office and likewise that quarter samples of milk be sent in 10 days to two weeks following treatment. Most treatments are administered during the dry period. All cows freshen in maternity pens and are not returned to the milking barn until a bacteriological examination of quarter samples of milk has been completed. They are then placed in the group that the bacteriologic findings indicate they should go into.

### Milking Routine

In any control program it is imperative that a good milking routine be set up. Negative cows and heifers are milked first and infected cattle last. Udders are washed with individual sterile towels moistened either with chlorine 400 p.p.m. or preferably with roccal one ounce to four gallons of water. Examination is made of the foremilk and a record kept of the findings. The animal is then milked, the ends of the teats dipped in disinfectant, the milk weighed and the next cow prepared for milking. The floor and bedding are kept clean and dry. Superphosphate is scattered on the alley behind the cows.

Where milking machines are used it is important to see to it that the teat cups are cleansed between cows. This is accomplished by dipping the teat cups in clear water and then in chlorine or roccal solution. One should be certain to see that the solutions enter the teat cups. Udders are washed as provided for in hand milking.

### New Jersey Plan for Mastitis Control

In New Jersey we have two plans of mastitis control, one for the state-owned

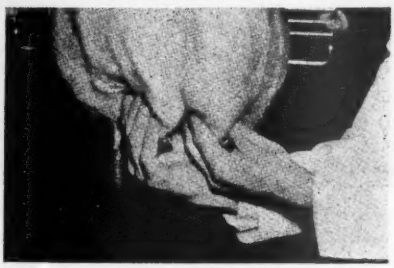


*Photo by Udall*

**Palpation of the udder is an aid in diagnosis of mastitis**

herds and another for privately owned dairy herds. There is little difference between them. The health of the herds belonging to state institutions is a responsibility of my department and naturally we can tell them what to do in the matter. In the case of private herd owners adoption of the plan is purely voluntary.

In either case the diagnosis and treatment is by a local veterinarian selected and paid by the institution in the case of state herds and by the owner in the case of private herds. In private herds we supply the local veterinarian with vials for the collection of milk samples and examine, without charge, the samples sent to us. The laboratory reports are made to the veterinarian. He collects the samples, makes the report to the owner, makes the diagnosis and prescribes and carries out the treatment. In state herds a representative of my department collects the milk samples and all treatment and the result thereof are reported to the Department by the local veterinarian.

The following letters are used in this work. The first is sent to the head of all state institutions that own herds of dairy cattle. It goes through the state Head of Institutions and Agencies. The second document is sent to the local veterinarian selected by the state institution or the private herd owner. The third is sent to the private herd owner from whose herd milk samples have been submitted to our laboratory for examination.

To the Head of the Department of
Institutions and Agencies
Trenton, New Jersey
Dear Sir:

The following program shall be applied for the control of mastitis in state-owned dairy herds operated by the Department of Institutions and Agencies:

1. All lactating animals in the herd shall be examined by agents of the Bureau of Animal Industry to establish the bacterial flora of each udder.

2. Following receipt of report of the bacteriological findings of quarter samples of milk, the head herdsman at each institution shall restanchion all cows in accord with the bacteriological findings, grouping all cows infected with streptococci at the end of the row of stanchions, followed by those infected with staphylococci, *B. coli*, diphtheriod, etc. All negative animals shall be stanchioned at the head of the milking line.

3. The herdsman, in conjunction with the local veterinarian, shall critically review the status of each of the infected animals and shall consign to slaughter those cases of mastitis which, in the opinion of the veterinarian, are not amenable to treatment, providing the animal is producing milk not suited for human consumption and is not an efficient, economic milk producer.

4. Cows, whose milk is not suited for human consumption but whose value as breeders and milk producers is sufficient to warrant maintaining them in the herd and where the disease is, in the opinion of the veterinarian, amenable to treatment, shall be isolated from the milking unit and treated by the veterinarian. Reports of such treatment shall be made to the Chief of the Bureau of Animal Industry on post cards provided for this purpose. All animals treated shall be examined at approximately 10 days to two weeks following treatment and shall not be returned to the milking line until quarter samples of milk have been examined and the results are known. They then shall be stanchioned in accord with the bacteriological findings with whatever group these findings would indicate they belong.

5. All cases infected with streptococci, not pathogenic for humans, if otherwise providing a potable milk, may be left untreated until the dry period.

6. It shall be the sole responsibility of the local veterinarian employed by the institution to

determine when and what treatment shall be administered.

7. All cows shall be placed in maternity stalls for freshening and no cow shall be returned from the maternity barn to the milking barn until the bacteriological examination of quarter samples of milk collected after parturition has been completed. These animals will then be stanchioned with whatever group the bacteriological examination indicates.

The following program for milking routine shall be established on each farm, regardless of whether the animals are milked by hand or by machine:

I. The milkers shall wash their hands immediately before milking each animal, using for this purpose towels supplied by the institution. It is suggested that the milker be equipped with a carrier large enough to hold two buckets, one filled with individual towels in a disinfectant solution and an empty one to be used to receive the towels, following use.

II. The milker shall obtain a towel from those in the disinfectant solution and squeeze out some of the solution, allowing it to run down the gutter, then wash the udder and flank of the animal thoroughly. The towel is then reversed, wrung dry and the udder dried with the reverse side of the towel. The used towel shall be placed in the discard pail and a new one obtained for each cow.

III. A foremilker, preferably of the blackboard type, shall be used on each cow prior to milking and a record kept of the findings such as clots, pus, blood, thick or thin milk, etc., following which the cow shall be milked out, the milk weighed and recorded.

IV. Where milking machines are employed, the udder shall be washed as provided for hand milking. The animal shall be foremilked as provided for hand milking. Teat cups shall be submerged in a bucket of clear water and then dipped in a bucket of disinfectant prior to use on each animal.

V. Following the milking, whether by hand or machine, the ends of the teats of the animal shall be submerged in a basin containing either two-hundred fifty parts per million of chlorine or roccal solution, whichever is in current use in the barn for washing udders.

VI. The herdsman shall report to the local veterinarian any animals exhibiting an acute flareup of mastitis as well as those whose foremilk contains blood or thick milk.

VII. The Bureau of Animal Industry shall be responsible for collecting and examining quarter samples of milk from the entire herd at least twice a year as well as the examination of samples of milk whenever submitted to the laboratory for bacteriological examination. It is to be understood that this program is one for the control and eradication of *Streptococci agalactiae* infection and does not guarantee freedom from inflammation of the mammary tissue. It is expected that this program, if properly carried out, will materially reduce the incidence of mastitis resulting from infection with microbial agents.

The opinion is held that it is entirely reasonable, practicable and economically possible to produce a superior milk in our institutional herds and to increase milk production through a reduction in the milk loss occasioned because of mastitis. It is recommended that steps be taken to give public recognition to those institutional employees that are eminently successful in maintaining healthy, productive livestock on our state-owned farms.

Very truly yours,
S/R. A. HENDERSHOTT,
Chief, Bureau of Animal Industry

## Instruction to Veterinarians Relative to the Collection of Samples of Milk for Laboratory Diagnosis for Mastitis

The Department of Agriculture through the Bureau of Animal Industry in the interest of economic healthful milk production offers the dairy farmers of the State of New Jersey, through their local veterinary practitioners, a bacteriological diagnostic service in connection with the control of infectious mastitis.

### Method of Collecting Samples

1. The veterinarian may make application in writing to the Bureau of Animal Industry for sterile vials for the collection of milk samples, or

The dairy farmer may make application but must give the name and address of the veterinary practitioner who will be employed to collect samples and advise in the control and administer treatment.

**A towel wrung from the disinfectant solution should be used for cleansing the udder**
*Photo by Bryan*

Tubes will be prepared by the Bureau and sent only to licensed graduate veterinary practitioners.

2. It is advisable to see to it that the barns in which samples are to be collected are clean and free from dust and draught.

3. The udder of each cow is to be washed, using individual towels moistened in chlorine, 400ppm.

4. Immediately following this the teats are to be cleansed with cotton moistened with alcohol. Separate pledgets are used for each teat and the teats are cleansed in the following order: L.H., L.F., R.H., R.F. Caution should be used to clean the teat orifice thoroughly.

5. Holding the vial in a horizontal position, direct the flow of milk into it milking the quarters in the following order: R.F., R.H., L.F. and L.H.

6. Marking vials.

The system employed in marking vials is as follows: L.H. No. 1, L.F. No. 2, R.H. No. 3 R.F. No. 4.

Caution should be exercised to prevent contaminating organisms from gaining entrance to the vial.

When quarter samples are drawn, 10cc of the first milk should be taken.

Caution must be taken to stopper the milk vial securely for shipment to the laboratory.

Whenever practical it is advisable to deliver the samples to the laboratory as soon as possible following collection. Check to be certain that the vials are properly numbered and are in agreement with the charts.

Pack charts with milk tubes so that both arrive at the laboratory together.

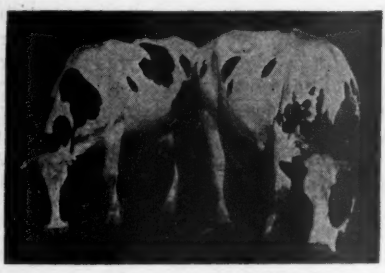
Reports: A diagnosis or a report of laboratory findings in detail will be mailed promptly to the veterinarian as soon as the readings are made—usually examination is complete 24 to 36 hours following receipt of milk samples.

The owner will receive a form letter, a sample of which is appended.

The Bureau does not in any case recommend what treatment is or should be administered to dairy animals in the treatment of mastitis. We have for some years past recommended that all dairymen make a sincere effort to control the disease and have oftimes made the following suggestions:

1. Employ your veterinarian to examine your herd and determine which animals are affected with mastitis.

2. Relocate your milkers in the barn so that



**All animals should be examined prior to purchase**

all negative animals are grouped together, all suspects together and all infected animals together.

3. Milk animals in following order—negative—suspected—infected.

4. Dispose for slaughter those badly infected animals that are unworthy of treatment.

5. Provide two clean towels for each milking animal in the herd.

6. Place clean towels in a bucket of chlorinated water containing 400 parts per million of available chlorine or roccal solution.

7. Wash the udder and flank of each milker immediately before milking, wring the cloth dry and dry udder.

This act will effectively wash the milker's hands at the same time.

8. Examine the foremilk from each quarter and make a record of any clots, blood, pus, flakes or watery milk, also record any swelling or injury of the udder or teats.

Note: This record should be presented to your veterinarian at the time he is called in to examine your herd.

9. Milk the animal rapidly and thoroughly. When milking machines are used the teat cups must be rinsed between each cow. In rinsing, first dip the cups in clear water and then in a bucket of chlorine solution. Make up a fresh solution of chlorine after 10 or 12 rinses.

10. All fresh cows should be examined and their status established before they are placed in the milking row.

11. All newly purchased animals should be examined prior to purchase and placed in their proper group in the barn.

12. Since infectious mastitis is oftimes spread during the dry period, it is recommended that farmers devote as much attention to dry cows as to those in milk.

Caution: Recently science has developed certain drugs that are of value in the treatment of certain infections of the udder.

Proper use of these agents requires that a bacteriologic diagnosis be made of the infection in suspected cases of mastitis as these products are of no avail in the treatment of staphylococci or colon infections.

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Dear Sir:

We have today completed a laboratory examination of ..... samples of milk collected and submitted by Dr. ..... from animals in your herd. A detailed report of the result of our examination has been mailed to Dr. .....

We would advise that you contact your veterinarian regarding the treatment of infected animals in your herd.

Very truly yours,
R. A. HENDERSHOTT
Chief, Bureau of Animal Industry

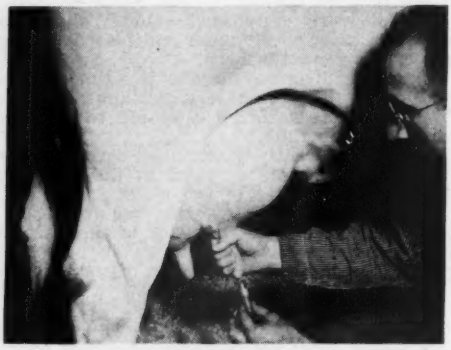
## A Method of Preserving Milk for Use in Mastitis Tests*

A simple technic has been described by van Rensburg (1941) for the rapid and accurate laboratory diagnosis of mastitis in cows, whilst in a subsequent publication van Rensburg and Thorburn (1941) have described how the test may be applied on a farm situated far from any laboratory. The test which was originally described by Hucker, Trudell and Jennings (1932) consists of collecting udder samples or quarter samples in as sterile a manner as possible. These samples are incubated overnight at 37° C. and a smear is made next morning from the incubated milk. A diagnosis is based upon the presence or absence of mastitis-type streptococci.

The test is easy to carry out but the collection of samples presents difficulties if a large dairy herd is being examined. Collecting samples in a sterile manner implies cleansing the tip of every teat with alcohol and arranging for each sample to be taken by a really skilled milker. In practice in a large dairy herd upwards of 20 natives may be milking

*McLaghlan, J. A., and Pullinger, E. J., Municipal Chemical Laboratory, Johannesburg, S. Africa. *J. S. Afri. Vet. Med. Ass'n.* 15:3, pp. 111-112, 1944.

simultaneously in different stables and all this routine work must be held up whilst samples are being collected. It is far better if the samples can be collected by the routine milkers as they start each fresh cow and after the



**It is expedient if the samples of milk for testing are drawn by the routine milkers after the udder and teats are cleansed for milking** *Photo by Bryan*

udder has received normal preparation. Done this way sampling causes no delay and does not disturb the animals themselves. The milkers must, of course, wash their hands after milking each cow, but since this should be a normal dairy practice the introduction is all to the good. In any case even when samples are taken with the greatest of care contaminants are liable to get in and ruin the test.

To bring this test on to a really practical footing it is desirable to modify it in such a way that the ordinary farmer can collect samples himself and despatch them to the laboratory and, in bringing this into the realms of practical politics, the problem of bacterial contaminants must be faced.

In an attempt to reduce the interference due to the contaminants, bacterostatic dyes have been added to the samples. Numbers of dyes have been tried out and according to Bryan and Huber (1935) brilliant green gives the best results. For general cultural purposes, however, Edwards (1933) found a special batch of purified crystal violet to be most useful, and since some of this dye was available it has been put into use in the present investigation.

It was found that if samples, collected in the ordinary way by the usual milkers, were hurried back to the laboratory and crystal violet was added to give a final concentration of about 1:200,000 the problem of saprophytic contaminants became of small importance due to the selective bacteriostatic action of the dye.

Whilst this was a useful step forward, the difficulty of getting samples back to the laboratory quickly enough still remained. Adding a solution of dye to sample bottles before-hand is of no use because dye particles are absorbed on to the glass and remain fixed there.

Finally it was decided to try and incorporate the required amount of dye into easily soluble tablets, one of which could be added to each sample bottle in advance.

### Preparation of Tablets

In order to give a suitable bulk to the tablet without causing excessive frothing on the addition of milk, an effervescent mixture with a large excess of sodium bicarbonate was used.

Tartaric acid .....0.5 grams
Sodium bicarbonate .....5.0 grams

were mixed together whilst dry. Then a solution of 5.0 milligrams of crystal violet in absolute alcohol was worked into this mixed powder. More alcohol was added to give a suitable consistency to the paste. The mixing had to be carried out very carefully to ensure proper distribution of the dye throughout the paste.

A glass tube and a glass rod of good sliding fit were chosen. The glass tube was drawn out to a constricted end which was ground down to give a sharp orifice about one-eighth of an inch in diameter. The mixture was extruded through this orifice by pressure on the glass rod, and short lengths were cut off. After weighing a few lengths it was possible to establish the length necessary to give 0.05 milligrams of dye per pellet. Such a pellet would give a final concentration of 1:200,000 in 10cc of milk.

The foregoing description gives a simple procedure for preparing tablets of approximately correct strength. For manufacture on a larger scale a tablet press would be required. The dye concentration need not be particularly accurate because crystal violet is bacteriostatic over a wide range of concentration. This is fortunate because when collecting milk samples under practical conditions, it is quite impossible to fill all sample bottles to the same level because of the interference of milk froth.

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# A Clinical and Laboratory Study of Spontaneous Listerellosis in a Goat*

By MARTIN M. KAPLAN** and ARTHUR E. LAGER**
Waltham, Massachusetts

RECORDED clinical observations concerning caprine listerellosis have been meager. In a primarily histopathological study of nine goats, King[1] reported that the clinical course of the disease lasted two to three days with few distinctive signs. The animals went down and were unable to rise. Obvious neurological signs were rare. Specific motor weakness, or spasticity, were seen only infrequently. Gifford and Eveleth[2] reported one case where the animal could not get up and lay with its head cramped around permanently to the left side. There were also impaired vision and an inability to swallow.

In the case described in this paper, a unique opportunity was presented to make a detailed study of an individual infection because listerellosis was strongly suspected early in the course of the animal's illness. No previous case of listerellosis in animals has been reported in Massachusetts. One case of human listerellosis was reported in this state in 1936.[3]

## History

October 2, 1944, the owner noticed that one of his 10 purebread Toggenberg goats refused to eat. The goat was 1½ years old and in her sixth month of lactation subsequent to a normal parturition. He reported that the animal had a ruffled hair coat and stood quietly with her eyes half closed. Two doses of epsom salts were given on successive days, but no improvement resulted. October 4th a veterinarian was called. The goat at this time had a temperature of 105° F. and, except for a slight depression, showed no other abnormal signs. Fifteen cubic centimeters of neoprontosil was injected intramuscularly, and one-half tablespoonful of sulfanilamide daily for three days was dispensed with a ruminatoric-tonic powder to be given in her feed. The animal appeared improved for the next few days.

October 7th she was exposed overnight to a rainstorm. Two days later the owner noticed lameness in her hind legs, and "blind staggers" characterized by incoordination and by inability to find her food. The goat's condition grew progressively worse and, finally, she went down and was unable to rise. She was brought to the clinic 10 days after first being noticed to be ill.

*Presented before the Massachusetts Veterinary Association meeting November 15, 1944.

**Department of Preventive Medicine and Public Health, Middlesex University, School of Veterinary Medicine, Waltham, Mass. Doctor Kaplan is on leave of absence with the UNRRA.

## Clinical Observations and Laboratory Findings

Results of the laboratory examinations made during the course of the disease are summarized in Tables I and II. The clinical descriptions will consider only changes in her condition, and significant laboratory findings.

*10/12.* T-102.5°F. P-76. R-24. The animal stood quietly with its back hunched slightly and hind legs drawn forward for support. The head was held about one foot from the ground. When forced to walk the animal revealed a lack of equilibrium, with the hind quarters swaying from side to side. The voice was weak and slightly higher pitched than normal. The pupillary reflex was normal and the eyes were clear, but there was a slight congestion of the conjunctival vessels. The oral mucosa was fairly pale. Defecation and urination were voluntary. Sensitivity to painful stimuli appeared normal. Mentally, the goat seemed slightly depressed although she reacted to sound stimuli and evinced interest in other animals. The remainder of the physical examination (heart, lungs, abdominal palpation) revealed nothing significant.

The urine was strongly positive for sugar. The blood count was normal except for a reversed ratio of neutrophiles (70%) and lymphocytes (30%). A fecal examination showed a moderate infection with *Haemonchus contortus.*

*10/13.* The goat was down and unsuccessfully struggled to stand. When helped to her feet she walked several steps in a vertiginous manner unaided, then fell on her side and tried vainly to rise. While lying on the ground, a position of partial opisthotonos was assumed for short periods. The appetite and rumination were normal.

A cerebrospinal fluid examination was made and compared with that of a normal goat.†

The fluid from the control goat was watery clear, negative to the subsequently mentioned tests and had nine cells per cu. mm. The cerebrospinal fluid from the affected goat was slightly cloudy and a delicate fibrin clot appeared 30 minutes after withdrawal. Pandy's

†The technic used in obtaining cerebrospinal fluid is very easily mastered. The animal is placed either in a standing position or on its side. The head is flexed and an area is shaved on the dorsal midline of the neck posterior to the nuchal crest. With the fingers of the free hand, the anterior border of the wing of the atlas is palpated. A direct line from this point to the dorsal midline of the neck should fall 8 to 9cm posterior to the nuchal crest. A 4cm 18-gauge needle attached to a syringe is gently inserted at approximately an 80 degree angle (the needle directed slightly forward) and inserted to a depth of about 3cm. The foramen magnum is thus entered and slight withdrawal suction usually yields pure spinal fluid. Occasionally minimal capillary bleeding is encountered in the first few drops of fluid, and this portion is discarded and a new syringe attached to the needle. The fluid should then be free of blood due to any puncture trauma. Surgical cleanliness should be an integral part of the technic.

test for increased protein was positive. The cells, predominantly lymphocytes, numbered 50 per cu. mm.

*10/14.* The eye grounds, examined with an ophthalmoscope, appeared normal. When placed upon her feet, a condition simulating radial paralysis of the left front leg was noted. (It is interesting to note that a rabbit injected with a culture of the isolated organism developed a similar paralysis). A leucocytosis (19,500 per cu. mm.) was found.

*10/16.* The pulse was 160 per minute. The urine, strongly positive for sugar until the last day of life, showed a high specific gravity (1.050). The leucocytosis was decreased to 13,950 per cu. mm.

Ten grams of phenothiazine was given in capsule form to eliminate the stomach worms. No other medication was administered throughout the course of the disease.

*10/17.* The leucocyte count was 19,100 per cu. mm. A red discoloration of the urine was present because of the phenothiazine given the previous day.

*10/18.* A blood sugar determination (Folin-Wu method) revealed the high level of 250mg per cent, as compared to 57mg per cent in a control goat fed the same diet. The erythrocyte count dropped to 12.83 million per cu. mm. A cerebrospinal fluid examination revealed slight cloudiness, a positive Pandy test, and 120 cells (predominantly lymphocytes) per cu. mm. A quantitative sugar analysis of the cerebrospinal fluid gave 41mg per cent as compared with 49mg per cent in a normal goat. Inoculation of the cerebrospinal fluid into dextrose semi-solid agar, serum agar, Loeffler's medium and a blood agar plate showed no growth after one week's incubation except for one colony of *Staphylococcus aureus* which was felt to be a contaminant.

*10/19.* Emaciation was becoming apparent. A trace of albumin was detected in her urine. The erythrocyte count jumped to 16.6 million per cu. mm. and the leucocyte count reached 29,400 per cu. mm.

*10/20, 21, 22.* Her condition was slightly poorer. Sporadic, involuntary movements of her hind legs were noted while she was lying down.

*10/23.* The blood sugar level was 132mg per cent. The urine reaction was acid. The blood counts showed 32,000 leucocytes per cu. mm. (79% neutrophiles), 14.09 million erythrocytes per cu. mm., and the hemoglobin had dropped to 7.5gm.

*10/24.* She was still capable of standing unaided when placed upon her feet. The animal appeared to have good coordination in the hind legs when forced to walk aided by support of the front end of the body (necessitated by the paralysis of the left front leg). The leucocyte count had dropped to 22,100 per cu. mm.

*10/25, 26.* Her temperature had dropped to 99.5° F.

*10/27.* The animal's conditions had markedly deteriorated. The temperature was 93° F. and the pulse (80 per minute) was weak. Rumination, eating, and drinking of water persisted to the end, as did also a fair degree of mental alertness. Chemosis was present. Ophthalmoscopic examination revealed no changes in the fundus of the eye. An x-ray plate of the skull showed no abnormalities. The urine was acid, but no albumin or sugar was detected. A quantitative blood sugar examination (checked twice) gave the low level of 16mg per cent. Cerebrospinal fluid was withdrawn into four tubes successfully. All tubes showed slight turbidity and clotted within five minutes which prevented further examination.

It was felt that the animal would not survive the night so that euthanasia (electrocution) was performed and a post-mortem examination made immediately thereafter.

### Post-Mortem Examination

Cachexia was pronounced. The horn cell area of the anterior cervical region of the spinal cord showed scattered petechial hemorrhages. Grossly, no other changes were apparent.

### Histopathological Examination††

In the medulla there was a distinct perivascular cuffing (see Fig. 1). Tigrolysis of the

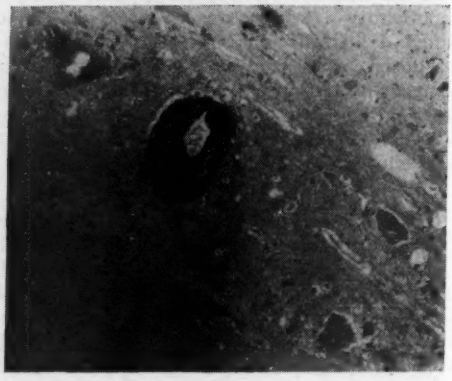

**Fig. 1. Medulla x 100: Note areas of perivascular cuffing**

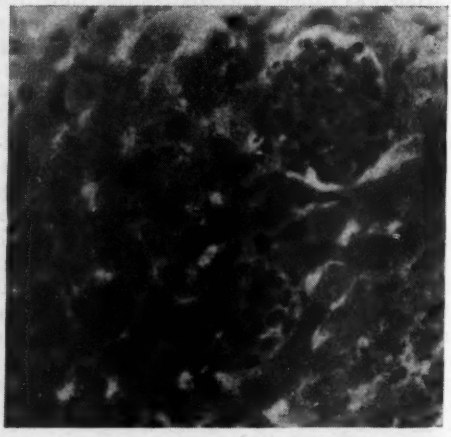

**Fig. 2. Liver x 970: Note scattered small foci of polymorphonuclear and mononuclear cells**

††We are indebted to Dr. T. Wong of the Department of Pathology for the histopathological studies.

neurones and areas of increased glial cells were present. The meningeal vessels were congested.

In the cerebrum, small foci of five to eight oligodendroglia were scattered in the white matter. The capillaries were congested and only a suggestion of cuffing (one layer of cells) was noted.

The cerebellum showed perivascular cuffing in the white matter. In the molecular layer, the Purkinje cells disappeared in certain areas, and loose foci of mononuclear cells were present.

The sinusoids of the liver were distended. Scattered small foci composed of polymorphonuclear and mononuclear cells were present (see Fig. 2).

### Bacteriological Studies

Pieces of the medulla were removed aseptically and dropped into dextrose broth, serum agar slants and streaked onto blood agar plates. *Listerella monocytogenes*, a short, gram positive, slightly motile rod, was recovered in pure culture from the dextrose broth and serum agar slants.

After the first subculture, the isolated organism proved to be strongly hemolytic in blood agar plates within 18 hours. Acid, but no gas, was produced within 72 hours in xylose, dextrose, lactose, maltose, sucrose and trehalose. Dextrin was only slightly reduced. No reaction occurred in salicin, inulin, and inositol after two weeks incubation.

Two rabbits were inoculated intravenously with 1cc of a 48-hour dextrose broth culture. The first rabbit had a preinjection blood level of 6,000 leucocytes per cu. mm. Four days after inoculation, the blood showed a leucocyte count of 18,600 per cu. mm. with 23% monocytes, the typical reaction in this species to infection with *Listerella monocytogenes*. A complete paralysis of the right front leg occurred on the second day after inoculation. The rabbit recovered completely within two weeks. The second inoculated rabbit died within 36 hours. On necropsy the liver was studded with miliary foci from which the organism was recovered in pure culture.

### Discussion

Several features of this case are noteworthy.

TABLE I—BLOOD AND URINE ANALYSES

| | Blood Counts | | | | | | Urine Analysis | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Hemoglobin in Grams (Sahli) | Erythrocytes in Millions | Leucocytes in Thousands | Neutrophils in Per Cent | Lymphocytes in Per Cent | Blood Sugar in Mgms. Per Cent (Folin-Wu) | Color | Reaction | Sp. G. | Albumin | Sugar |
| 10/12/44 | (*) | 16.79 | 9.17 | 70 | 30 | (*) | Yellow Clear | Alkaline | 1.029 | Negative | Strongly Positive |
| 10/13 | 10.1 | 16.09 | 10.2 | (*) | (*) | (*) | Yellow Clear | Alkaline | 1.021 | Negative | Strongly Positive |
| 10/14 | (*) | (*) | 19.5 | 75 | 25 | (*) | Yellow Clear | Alkaline | 1.021 | Negative | Strongly Positive |
| 10/16 | (*) | (*) | 13.95 | (*) | (*) | (*) | Yellow Clear | Alkaline | 1.050 | Trace | Strongly Positive |
| 10/17 | (*) | (*) | 19.1 | (*) | (*) | (*) | Red Clear† | Alkaline | (*) | Negative | Strongly Positive |
| 10/18 | 9.1 | 12.83 | 17.3 | (*) | (*) | 250 | Red Clear† | (*) | 1.042 | Negative | Strongly Positive |
| 10/19 | 9.0 | 16.6 | 29.4 | (*) | (*) | (*) | Red Clear† | (*) | (*) | Trace | Strongly Positive |
| 10/20 | 9.0 | 18.0 | 30.0 | (*) | (*) | (*) | Red Clear† | Alkaline | (*) | Trace | Strongly Positive |
| 10/23 | 7.5 | 14.09 | 32.0 | 79<br>Stabs 1<br>73<br>Stabs 2 | 20 | 132 | Orange Clear | Acid | 1.035 | Negative | Strongly Positive |
| 10/24 | 7.5 | 13.99 | 22.0 | Bas. 1<br>Eds. 1 | 23 | (*) | (*) | (*) | (*) | (*) | (*) |
| 10/25 | (*) | 15.0 | 25.7 | 76 | 22<br>Monocytes<br>2 | (*) | Yellow Clear | Acid | (*) | Trace | Positive |
| 10/26 | 7.0 | 16.62 | 21.35 | 69<br>Stabs 1<br>Bas. 1 | 29 | 16 | Yellow Clear | Acid | 1.022 | Negative | Negative |

*Indicates no examination performed. †Phenothiazine.
Acetone negative and urobilinogen normal on all examinations.
Sediment showed no pathological changes on any examination.

TABLE II—CEREBROSPINAL FLUID

| Date | Turbidity | Pandy Test | Cells Per Cu. Mm. | Cells in Mgms. Per Cent (Folin—Wu.) | Clotting Time |
|---|---|---|---|---|---|
| 10/13/44 | Slightly Cloudy | Positive | 50 | | 30 Minutes |
| 10/18 | Slightly Cloudy | Positive | 120 | 41 | |
| 10/27 | Slightly Cloudy | (No further examinations could be made as the sample clotted within 5 minutes) | | | |
| Normal Control Goat | Watery Clear | Negative | 9 | 49 | Did Not Clot |

In the observed protracted illness, despite the extensive central nervous involvement revealed microscopically, mental alertness and the nervous reflexes of rumination, pain, urination and defecation appeared unimpaired. Prostration and a paralysis of the left front leg were, however, prominent. King[1] observed that occasionally peripheral nervous system lesions are seen in the cranial ganglia or nerves. If the local paralysis of the leg was not due to trauma, it is quite probable that a peripheral lesion did exist although a search for it on post-mortem examination resulted in failure.

The persistent glycosuria and hyperglycemia until the last day of life was striking. Other observers[4,5] have noted this finding in ovine listerellosis, but it is not felt to be an invariable accompaniment of this disease. It is well known that transient glycosuria is often found in central nervous disorders like tuberculous, meningococcal, staphylococcal and streptococcal meningitis. In a recent review of glycosuria in human meningitis, Ferguson and Barr[6] showed that these glycosurias seldom lasted more than three days. These authors felt that the most likely cause of this phenomenon is increased intracranial pressure, or actual involvement of nerve structures around the fourth ventricle. The possibility of diabetes mellitus causing the sustained hyperglycemia and glycosuria, however, must be considered. The rarity of diabetes mellitus in animals, the normal histology of the pancreas and kidney on post-mortem examination and the establishment of the diagnosis of listerellosis militates against that possibility.

The increased turbidity, positive Pandy reaction and increased leucocytes in the cerebrospinal fluid have also been found in sheep affected with listerellosis.[4,5,7] Indeed, Gill[7] stressed the invariable opaqueness of the cerebrospinal fluid as an aid in distinguishing listerellosis from dietetic disturbances.

Graham, Levine, and Morill[5] indicate that the blood picture of listerellosis in domestic animals is unpredictable. Leucocytosis with a reversed neutrophile-lymphocyte ratio, as seen in this goat, is not an uncommon finding.[4,5] Neutrocytosis is the usual change seen in man.[8]

The early temperature rise probably marked the bacteremic phase of the disease before the organisms localized in the central nervous system, the site of predilection. Jensen and Gay[9] believe that in ovine listerellosis early cases may be detected by a rise in temperature.


## Summary

The first case of animal listerellosis in Massachusetts is reported. The affected animal, a goat, lived 25 days after the first signs of illness were apparent.

Prostration and a paralysis of the left front leg, simulating radial paralysis, were the only clinical evidences of nervous involvement. The appetite, nervous reflexes and mental alertness were retained throughout the course of the disease.

Blood counts were mainly characterized by a leucocystosis, with neutrophiles predominant (70 to 80%) in the differential count.

Persistent glycosuria and hyperglycemia, the latter reaching 250mg per cent, were found. Terminally, a severe hypoglycemia of 16mg per cent was noted.

Cerebrospinal fluid examinations revealed slight cloudiness, small increases in cells, positive Pandy tests and a slightly subnormal sugar content (41mg per cent).

Histopathological examination of the medulla, cerebrum and cerebellum showed the perivascular cuffing typical of the disease. The liver displayed distended sinusoids and scattered small foci of polymorphonuclear and mononuclear cells. Grossly, the horn cell area of the anterior cervical region of the spinal cord had scattered petechial hemorrhages.

The organism, *Listerella monocytogenes*, was isolated from the medulla when examined postmortem, but was not isolated from cerebrospinal fluid taken while the animal was alive.


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★★★ BUY WAR BONDS ★★★
AND HOLD THEM

# Reminiscences IV

By NELSON S. MAYO
Highland Park, Illinois

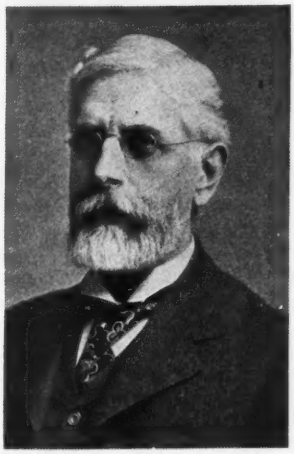
IN 1896, the Populist political party came into power in Kansas and a Populist Board of Regents controlled the College. One of their first moves was to declare all faculty positions vacant and then to rehire those whom they desired. Among these positions were those of the president of the College, mine and some 15 other members of the faculty who resigned and were not reemployed. One of the board members assured me that my work was satisfactory and there was no personal objection but they understood that we did not agree on "fundamental principles." They also averred that, among other things, the College had been teaching students how to produce more and of better quality while the great problem was one of distribution and they proposed to have one college in the country where the new ideas in political economy would be taught.

With a family of three small children, I was out of a job and facing a problem. An opportunity arose to secure an appointment as an army veterinarian, but at that time the status of army veterinarians was a peculiar one. They received the pay and allowances of a second lieutenant mounted but were neither officers nor enlisted men. A cavalry officer, a hunting comrade, told me, "there are snobs in the Army who would make a veterinarian's social life disagreeable"—so this proposition was turned down.

Since my ambition was to continue in college and research work, when Dean James Law, Cornell University, offered me a minor teaching position which would enable me to do advanced work in bacteriology under Doctor Moore and histology under Doctor Gage it was accepted. However, after only a couple of weeks, I was offered a position as Professor of Veterinary Science and Physiology at Storrs College and accepted. Storrs was then the Connecticut Agricultural College but is now the University of Connecticut. It was a great change from the fertile prairies of Kansas to the rocky hills of Eastern Connecticut, where oxen were still used to a limited extent for draught. Storrs College had, at that time, the largest pair of Jersey oxen that I have ever seen.

Storrs was a small college eight miles from Willimantic and three miles from a railroad station. Besides the College buildings, there were a country store and a blacksmith shop.

In addition to teaching I supervised the College livery stable which had eight to 10 horses. Only a few days after my arrival a gentleman drove in and wanted to talk about bovine tuberculosis. During our visiting, he mentioned that there had been a State Veterinarian in Connecticut who had started compulsory tuberculin testing of dairy herds which aroused so much opposition that the legislature had abolished the office and, instead, had provided for a Cattle Commissioner. My visitor had been appointed to the newly created office. He stated that he knew nothing about bovine tuberculosis but was sure he could handle the political end and wished me to do the technical work. With this setup, in a relatively short time we were tuberculin testing many herds successfully and without friction.



DANIEL ELMER SALMON, 1850-1914.
was graduated from Cornell University (1872) and studied at Alfort. He was chief of the B.A.I. (1884-1905) and head of the veterinary department of the University of Montevideo 1906-1911

The college work at Storrs was not heavy and there was ample time for some practice. There was no graduate veterinarian within a radius of 20 miles—and 20 miles in horse and buggy days was the equivalent of more than 100 miles at present. There was a non-graduate in Willimantic who had engaged in a violent war of words with my predecessor. Which was victorious I did not learn, however, my experience had been that it was better to be friendly with quacks than to fight them, so I called on him. He was pleased and, because he "had rheumatism in his right arm so badly that he could not hold a knife," he asked me to spay a bitch for him. However, while operating on the bitch, I took pains to make

no demonstration although he "rubbered" vigorously. He then said that he had quite a few such cases and wanted to send them to me on a 50-50 basis. This offer was declined but, since he could not perform the operation, much to his chagrin, he had to send them anyway.

The summer vacation found me continuing

ROSCOE R. BELL
Editor of American Veterinary Review and pioneer proponent for Army Veterinary Legislation

the work in bacteriology at Cornell that I had started the preceding year.

My first barn foreman at Storrs was Fred Bushnell, a graduate of the College. When he decided to study veterinary medicine I aided in arrangements so that he could go to the New York State Veterinary College at Cornell University and partly work his way through. He became a successful practitioner. Doctor Bushnell died some years ago but his son carries on the father's work in Connecticut. Another barn foreman was Cassius Way, also a graduate of the college.

One day a farmer called me to come and look at a horse that "had a sore." It proved to be a case of fistulous withers and, on examination, a necrotic dorsal spine was revealed. Not being prepared to operate, I instructed the owner to bring the horse to the College. Later, he called to say that he had decided to destroy the animal, whereupon I asked him what he would take for the horse and he agreed to "five dollars and your trip." Cassius Way was to get the horse and receive a half interest and, when the horse recovered if it did, I would either buy or sell my half interest. The horse made a good recovery and we put him in the livery for a time. One day when driving the horse past the farmer's home he stopped me and asked why I had not told him that the horse would get well so quickly. He was assured that I did not know how long it would be in recovering and I had given him an honest opinion, but, since he appeared to know more about the case than I it would seem that he had no cause for complaint. It was disclosed that my "quack" friend had been treating the case for a year. Cassius Way bought my interest in the horse and took it to his father's farm. Soon afterwards he went to Cornell and took his degree in veterinary medicine.

Another Connecticut student whom I started on a veterinary career was W. W. Dimock. As all veterinarians know both Way and Dimock later became presidents of the A.V.M.A. and both have made important contributions to equine medicine—Dimock in the field of research and Way in practice.

In Connecticut a good deal of work in the

RUSH SHIPPEN HUIDEKOPER
An indefatigable worker during the late 80's for the establismehnt of an Army Veterinary Corps

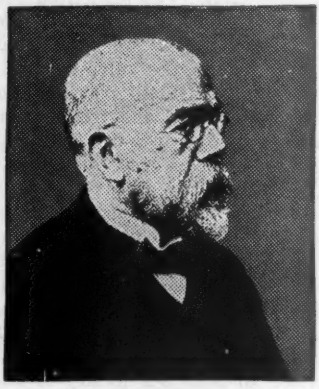
Granges and farmers' institutes fell to my lot. This and my work with the Cattle Commissioner made many friends for me throughout the state.

A number of faculty ladies were collecting antique china, pewter, etc., and they suggested that when at old farm houses I be on the lookout for such things. One day, while visiting an old farm, the hired man was fixing something around the barn and he had his nails in a metal dish the shape of an old-fashioned soup plate. It looked to be pewter but was found to be copper. Knowing that copper antedated pewter in the arts I bought the "find" for 50 cents. When taking my prize to the house I met a Yankee friend who was curious about my purchase. Informed that it

was an "antique copper plate," he looked it over carefully and remarked, "It looks like the copper bottom from an old teakettle." It was—and at an inflationary price worth less than a nickel. Needless to say, my reputation as a judge of antiques crashed.

In 1900, following a controversy with the President of the College over a matter of policy, my resignation was requested and given. This incident aroused a good deal of criticism throughout the state and, as a result of public pressure the President resigned. The next Christmas, my good Connecticut friends sent me a diamond studded watch charm as a present.

Just at the time of my resignation at Storrs, 1901, Dr. Tait Butler, who had succeeded Dr. Paul Fisher at Kansas State College, resigned to join the staff of the *Progressive Farmer*, the leading agricultural paper of the South. The Populists were out of power in Kansas by that time and I was offered my old position



ROBERT KOCH
Doctor Koch was at the pinnacle of his fame at the turn of the century

and accepted. So we "pulled up stakes" and returned to Kansas.

The profession of veterinary medicine was an interesting one at the close of the last century. Progress was as rapid as at present; the profession enjoyed able leadership. Tait Butler was president and Sesco Stewart, Secretary of the A.V.M.A. the year that I left Connecticut. R. R. Bell was Editor of the *American Veterinary Review* and Rush Shippen Huidekoper of the *Journal of Comparative Medicine and Veterinary Archives*. Contrary to what many now assume, the profession was not concerned solely with equine medicine. An examination of the periodical literature of the day reveals about the same proportion of clinical reports dealing with the ailments of other species as at present. Then, as now, there was much interest in the Philippines and there was scarcely an issue of a veterinary magazine that did not contain an article discussing matters of veterinary interest in the Islands. State veterinary associations existed in nearly all the states and veterinary practice laws had been enacted or were under consideration in most of them.

In that year (1901) the U. S. Department of

L. A. MERILLAT
Doctor Merillat has occupied a place of leadership in three generations of veterinarians and is still active.

Agriculture distributed 2,500,000 doses of blackleg vaccine; there were several serious outbreaks of anthrax; vaccination for the prevention of hog cholera received much discussion, although the Dorsett-Niles discovery was still some years in the future; the University of Pennsylvania began holding veterinary short courses; Koch's statement that the bovine type tubercle bacillus is not infectious for man set bovine tuberculosis control back a dozen years in this country; Ed and L. A. Merrillat conducted a department of surgery in the "Review" and W. E. A. Wyman a similar one in the "Archives."

D. E. Salmon was chief of the B.A.I. and Arthur W. Miller, the present chief, was graduated from the Kansas City Veterinary College and began practice at Herington, Kansas, in 1901. A Brooklyn veterinarian was fined $250.00 for leading a glandered horse along a public street; Hal Simpson returned from trips totaling 38,500 miles on Army animal transports; Cecil French published articles on canine nutrition and Merillat published a report of 15,000 cases in which chloroform anesthesia was used in horses.

George Fleming, principal Veterinary Surgeon of the British Army and founder of *The Veterinary Journal* died as did also Huidekoper (December 17, 1901) for many years a leader in the veterinary profession in this country.

*(To be continued)*

# Clinical Reports

## Azoturia in a Sawmill Horse

Late last October I was called to a sawmill 40 miles distant to see a four-year-old, 1600 pound percheron gelding that had been down for eight hours.

temperature sent the mercury to the top of the tube—110°F. The mucous membranes were congested, the pupils dilated and the gluteal muscles rigid and painful.

The diagnosis was azoturia.

Two-hundredy-fifty thousand units of thiamine hydrochloride (vitamin $B^1$) was administered subcutaneously. The horse soon became quiet and I left. A half-hour later he drank three gallons of water. Just before I left he had refused water which was offered to him.

The owner reported that the next morning he went to look at the horse fully expecting to find him dead. Instead, he was discovered at the corral, half a mile away. The animal was still somewhat stiff, so I made another call and gave him 125,000 units of thiamine hydrochloride. That night the owner reported him to be all right.

The owner called again the next morning and wanted to know when the horse could be worked. I told him in a week.

I saw this animal only recently and the owner told me he has not missed a day since going back to work.

D. M. Williams

McComb, Miss.

## Vitamin A Gives Excellent Results in Acetonemia

I have been using vitamin A in the treatment of acetonemia for a year and in that time have treated 165 cases using approximately 150 million units of vitamin A, as my drug bills show. With it I have accomplished results that I was never able to obtain with chloral hydrate or any other treatment. I have treated lactating cows, springers, heifers and one bull. Ninety per cent of them recovered promptly with no other treatment, the remaining 10% required additional treatment for complications, mostly metritis.

The attacks in springers are usually lighter than those that follow parturition. The bull was impotent—so dopey he wouldn't pay any attention to a cow in heat. Within a week after he was given 100,000 units of vitamin A he would chase anything on the place.

Lactating cows are ordinarily given a million units as treatment; 500,000 at the first dose and 500,000 the next day.

The following is typical of uncomplicated cases:

An 11-year-old Jersey cow, weighing 800 pounds, exhibited the following symptoms: slight nervousness, wobbly gait, inappetence, acetonemia breath and 4-plus urine.

She was due to calve in a week. She was given 500,000 units of vitamin A on the first call and 500,000 the following day. In 48 hours from the time of the first dose recovery was complete.

P. W. Horner

Houston, Miss.

## Pyometritis and Salpingitis in a Bitch

A Boston terrier bitch, seven years of age and weighing 4.7kg., was presented for treatment with a history of not having felt well for three months. One week previously she became quite listless, the vulva became greatly enlarged and a purulent vaginal discharge was noted. Urination was frequent and she continually tried to lap up the urine. The bitch had never been bred.

Upon palpation, the uterus and horns were found to be greatly enlarged. The pulse, respiration and temperature were normal. A diagnosis of pyometritis was made but, because of the age and run-down condition of the bitch, surgical interference was not attempted. A course of sulfathiazole was given for four days (15 grains per day). The owner was advised to feed her plenty of lean meat and beef broth to improve her nutrition.

One week later she was returned for treatment and it was deemed advisable to perform an oophorohysterectomy.

The median line spaying operation was performed under ether anesthesia. An unusually long incision was made. When the horns of the uterus were exposed they were found to be greatly enlarged and distended as were also the fallopian tubes. Both ovaries were normal. The ovarian attachments and stump of the uterus were ligated with catgut and the organs removed. The end of the stump was painted with liquefied phenol and then inverted and sutured to promote healing and prevent infection from gaining entrance to the peritoneal cavity. The abdominal incision was closed with four interrupted silk sutures through the skin, fascia, muscle and peritoneum. A sulfanilamide pack was placed over the incision and bandaged in place. Fifteen

grains of sulfathiazole was given daily for five days. The stitches were removed the 6th day.

The walls of the uterus were thickened—the horns, 4.5 x 1 inches weighing 127 grams.

The diagnosis of pyometritis was confirmed. Salpingitis also existed, the infection having ascended from the uterus into the fallopian tubes.

JOSEPH F. FULTON

Atchison, Kansas

## A Simple Operation for Contracted Teat Sphincter

For years I have been reading of operations for contracted teat sphincters, all of which required some type of cutting into the sphincter and the use of dilators between milkings.

It has been my experience that most farmers when using dilators usually neglect sanitary measures and thus infect the teat with resulting mastitis of that quarter. On this account it has been my practice to use a dilator as infrequently as possible; especially when further use of it devolves upon the owner of the animal.

A few weeks ago it was my good fortune to become associated in practice with Dr. R. Frank Fletcher of Platteville, Wis., and I have observed him operate on a number of constricted sphincters without a knife and the subsequent use of a dilator. In all cases his results have been excellent. I have tried his method and my results also have been highly satisfactory.

The technic is as follows: A bull lead is put on the cow and her head is pulled to one side. Another assistant holds the tail over the cow's back, pushing up strongly near the base, to prevent her from kicking. The affected teat is rolled between the palms of the hands and a few squirts of milk are expressed, if possible. The teat is then washed with alcohol and painted with tincture of metaphen. A four-inch Halstead forceps is inserted into the teat canal about one half inch, enough to be inserted firmly within the sphincter, and then the forceps is opened quickly, and withdrawn. The teat is then squeezed and the milk will flow normally. Usually one dilation is enough. Sometimes, however, the forceps must be inserted and pressure applied a second time.

Aftercare consists of frequent milking. No dilators are used and, therefore, the opportunities for infection is reduced to a minimum.

HARVEY G. TABLEMAN

Warren, Ill.

## Repairing an Abdominal Rupture in a Near Parturient Cow

When I returned from a call one day last month, my wife informed me that one of my clients had called during my absence and said that he had a cow whose intestines were dragging the ground. Only the preceding day she had told me this same client wanted me to call as his horse had "lost something." He really had told her that a horse had "thrown out a stifle." However the animal's difficulty in walking proved to be due not to something he had lost but to something he had found—a 14-penny nail, which was imbedded in a hind foot.

I telephoned the owner for further explanation as to this cow and ascertained that the report was exaggerated only in that the intestines didn't quite touch the ground. He didn't tell me there was a two-inch tear in the protruding loop of intestine. Possibly he didn't want me to worry on the way out to his place.

Upon arrival, I found a two-year-old Jersey, due to calf in a few days, with a sizeable

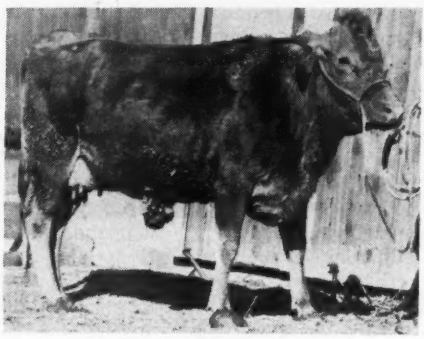


Fig. 1. The cow before the operation

loop of large intestine hanging beneath the abdomen (Fig. 1). She was entirely surrounded by neighbors, who had held council and decided the cow should be killed, but the calf saved if possible. I demurred. I could not see the logic of going 12 miles to kill a cow or see one killed. Most of all I was wondering why I should see two such unusual[1] cases within a year, after waiting 23 years to see my first one.

After a quick inspection I commenced calling for hot water, roller towels, old heavy window drapes and an old canvas from a grain binder. This scattered the curious, shut off the flow of well meant advice, and gave

[1] Patton, John W., Cow impaled on an angle iron fence post. *Vet. Med.*, 39:11, pp. 429-30, 1944.

me an opportunity to see if I could induce a pailful of intestines to go through a rent in the skin and aponeurosis which appeared altogether too small for their passage. The problem seemed akin to that of putting an egg or a ship into a narrow neck bottle—the difference being that the slit in the aponeurosis was four inches long, but very narrow. My numerous volunteer aids arrived about this time with the hot water, an old monk's cloth doorway drape, about eight feet long; a freshly laundered roller towel about 12 feet long, and also a binder canvas from which a 14-inch strip was cut to serve as a corset or abdominal belt.

I was now ready for a *modus operandi* not found in text books. The rent in the abdominal wall was just forward of the umbilicus and about two inches from the median line. The eviscerated mass was washed in warm, physiological saline solution and dusted with sulfanilamide. The rent in the intestines was repaired with three interrupted sutures of catgut. This was accomplished with the animal standing and I in the position my volunteer aids had decreed for the cow, flat on the back. After about 30 minutes, this position became most uncomfortable and stimulated my memory to a degree that I remembered "good surgeons see with their fingers," so I finished the operation on the "seeing eye finger tip" principle.

It wasn't easy getting that herniated mass in where it belonged but I soon caught on to a principle that worked—a little gut at a time carried through and placed where it belonged would stay put. Just pushed through the opening it would come right back out. It is surprising what can be done with patience and plenty of time. The sweat was really bothering me and fogging my glasses when the last vestige of gut disappeared from sight. A gauze drain liberally dusted with sulfanilamide was inserted in the wound, and with my finger tip the inside of the aponeurosis was liberally smeared with the same drug. One mattress suture of heavy umbilical tape was taken in the center of the rent, and drawn as tightly as possible. Just as the margins of the rent in the aponeurosis, which was supporting the weight of the abdominal viscera and a nine-month-old fetus, could not be spread apart to facilitate a return of the escaped intestine, so they resisted approximation to retain it. Other sutures were put on either end and drawn taut. Then the center suture was tightened again. This loosened the end sutures which again were drawn tight but even so the aponeurosis was brought into apposition only at the end sutures. The skin was coated on the inside with the sulfa drug and closed with interrupted sutures. More sulfanilamide was applied to the wound which was then covered with a sterile pad. The roller towel was wound snugly around the abdomen, followed by the monk's cloth drape drawn very snug and then the improvised surgical belt was buckled about as snugly as a saddle is cinched. We

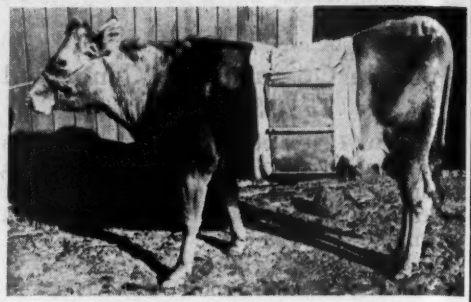


Fig. 2. Improvised surgical belt buckled snuggly in place

awaited the crisis, dreading a momentary onset of parturition. The animal ate and drank sparingly for 36 hours, but its appetite had fully returned by the third day.

The wound was undisturbed for six days at which time the stitches in the skin were removed and a fresh sulfa dressing was applied. I may have been a little hasty in removing the sutures on the sixth day, but I was afraid of stitch infection. I would say eight days would be about right. However, the wound was closed except for the orifice left by the drainage gauze.

The surgical belt, over a light sterile pad, was continued in use as a safeguard against the strain of parturition which didn't happen until the 10th day after the operation.

Perhaps the most unusual feature in this case was operating on the animal in the standing position and without any anesthesia. The owner thought she was due to calve at the time of the injury and being a primagravida and a Jersey of only average size, bred to a Holstein bull, severe straining could be expected. It was feared that casting the heifer would induce labor and perhaps disastrous straining.

As it turned out no anesthesia was needed. Not even when the skin was sutured was any restraint required. The cow stood in her regular stanchion throughout the operation. While I was lying on my back beneath her I had a man stand in front of her stifle and on each side, in a manner straddling it to prevent the cow from stepping in my face, but she made

no attempt to do so. However, in the standing position replacement of the viscera was very difficult, but as the abdomen was "tight as a drum" a recumbent position probably would not have made much difference.

Ten days after the operation I delivered a very large calf from this heifer. The owner

Fig. 3. To cow after the calf was born and the abdominal belt removed

stated it was the largest calf he had ever seen in his herd. There was no mal-presentation but owing to the large size of the calf the dam required a good deal of assistance to effect delivery, in fact $15.00 worth of help. The dystocia did not appear to be in any way a result of the injury she had suffered 10 days earlier.

JOHN W. PATTON

East Lansing, Mich.

## Treatment of Acetonemia in Dairy Cows

My practice is located in a fair dairy section about 50 miles west of Indianapolis and, for a number of years, calls to treat acetonemia have been frequent.

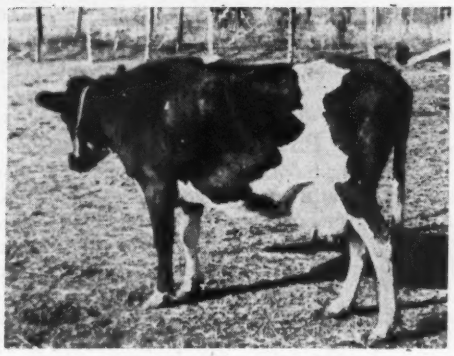
I have used vitamin "A" in the treatment of only a few cases of this ailment, to be exact in 15 cases, I like it very much. It definitely shortens the attack and gets the animals to eating sooner and back to full milk production quicker than any other treatment I have used.

As was my practice before using vitamin "A," I still give the animal two cupfuls of brown sugar daily, as a drench at first and on the feed as soon as the cow begins to eat. Maybe it isn't necessary but it can do no harm and I think they need some good quick energy producing food after passing through an attack of acetonemia.

I administer 500,000 I.U. of vitamin A daily for three days. Most of my cases occur when the animals are on dry feed and it seems desirable to stock them up with enough "A" to last them for some time.

While the symptoms of acetonemia disappear promptly under vitamin "A" therapy the restoration of full milk production requires somewhat longer. Most of my cases have required approximately a week after the vitamin "A" was administered to get back to full milk production and one of them required two weeks. It is a treatment that appeals to the dairyman. He keeps his cows for milk production and is pleased when he gets it promptly.

In a herd of registered Jerseys of unusual value I treated two cows recently. The first was a four-year-old with a calf two weeks of age. She was in good flesh and had a typical



Most of my cases of acetonemia return to normal milk flow in about a week

attack of acetonemia; very nervous, wobbly gait, S-curve in the back, no appetite, decreased milk flow, etc. This occurred about the middle of last November.

I gave her 500,000 I.U. of vitamin A daily for three days and two cupfuls of brown sugar as mentioned in the foregoing, with the result that she topped the list in the milk testing association for December.

The other cow, which was treated a few days later, has had acetonemia each year for the last three years. I saw her early in the attack. She was nervous but still eating. The urine reacted strongly to the Hayden test. I gave her 500,000 units of vitamin A daily for three days and no other treatment. She came back to full milk production immediately and has remained on high production to the present time.

I have had reports from other dairymen whose cows are making heavy milk production records after an attack of acetonemia. I give vitamin A a great deal of credit for holding up milk production in these cows after an attack of acetonemia.

PAUL F. SCOTT

New Market, Indiana

# Abstracts

## Chicken Mites Hosts of Encephalomyelitis Virus

An outbreak of encephalomyelitis occurred among horses in Texas in the summer of 1944. With the cooperation of two local veterinarians Goth[64] located nine ranches in Dallas County on which known cases of encephalomyelitis had occurred.

On one of these ranches neutralizing antibodies for encephalomyelitis virus were found in the blood serum of three of seven fowls. Chicken mites, *Dermanyssus gallinae*, collected on this ranch contained the virus and communicated the disease to Swiss mice and guinea pigs. No virus could be demonstrated in the bodies of the fowl ticks, *Argus persicus*.

## Efficacy of Divided Doses of Phenothiazine

Horses that have been maintained on a poor ration are quite susceptible to the deleterious effects of phenothiazine. Therefore the dose for such animals should be much less than the average dose for solipeds. Howell in an experiment at the University of California Arabian Horse Ranch[70] showed that a given quantity of phenothiazine administered daily in divided doses over a short period is as effective as when given in a single dose and probably even more effective. Thus the administration of 5gm of phenothiazine daily for six days removes as many strongyles as one 30gm dose and avoids the toxic effects that may result when animals in poor condition and those suffering from calcium or other deficiencies are given the larger dose.

## Treatment of Sprains

In painful sprains of the extremities where skin is not broken Bingham[59] advises spraying the skin over the painful area with ethyl chloride until the color changes but desisting before freezing occurs. This stops the sharp pain (referred pain). The patient is then urged to move the injured structure immediately through the full range of motion of the joint, slowly at first. After 10 to 20 movements he is asked to designate new areas of pain. These, if any, are likewise sprayed and the same routine exercises repeated. The exercise is repeated every hour and where swelling is excessive an elastic bandage applied. No cast, adhesive strapping nor other bandage is used. With this treatment the majority of soldier patients are returned to duty after an average disability period of less than three days.

The procedure has diagnostic value also since serious injuries are not relieved by the ethyl chloride spray, and in such serious cases a different treatment is then initiated.

## Non-Suture Anastomosis of Arteries

Experiments[66] were performed on dogs to develop a technic for the anastamosis of injured arteries. A section of vein was used to bridge the gap between the ends of the artery. Vitallium tubes instead of sutures were used to join the structures. Vein sections were used from the same animal, from other dogs or from different species. Vein segments were used—both fresh and preserved in a frozen state up to three weeks. Success was attained in 90% of the attempts in uncontaminated and in 65% of the operations on contaminated wounds 24 hours old. The section of vein was threaded through the tube and turned back over the ends. The ends of the tube were inserted in the cut ends of the artery. No anticoagulants were used. In two intances legs were amputated in the mid-thigh region and held in cracked ice for 24 hours and then reimplanted successfully.

## Conquest of Virus Diseases

Viruses cause disease in man, other animals, plants and bacteria.[58] They vary in size from slightly smaller than the largest protein molecule to slightly larger than the smallest bacterium. A virus can multiply and cause disease only within living cells. The first virus discovered was one that causes a disease of plants—tobacco mosaic virus (1892). The first virus discovered capable of producing a disease in animals was that of foot-and-mouth disease (1898) and the first virus of human disease discovered, was the causative agent of yellow fever (1901).

The known virus diseases of man, other animals and plants number more than 200 and include the most serious diseases and the most devastating plagues of all three groups.

The isolation of first (1935) tobacco mosaic virus and later other viruses in the form of high molecular weight proteins cast doubt upon the validity of the classification of viruses as living organisms. The viruses serve

[64] Goth, Andres. Recovery of equine encephalomyelitis virus (western type) from chicken mites. *Sci.* 101:2624, p. 381, 1945.

[70] Howell, C. E., and Britton, J. M. Sesaonal anthelmintic treatment of horses, *Vet. Med.* 38:1, pp. 8-11, 1943.

[59] Bingham, Capt. Robt., M. C. Treatment of sprains with ethyl chloride spray. *Mil. Surg.* 96:2, p. 170, 1945.

[66] Blackmore, M. D., Arthur H., and Lord, Jr., M. D., Jerre W. A non-suture method of blood vessel anastomosis. *J. A. M. A.* 127:12, pp. 685-691, 1945.

[58] Stanley, W. M., Progress in the conquest of virus diseases, *Sci.* 101:2617, pp. 185-188, 1945.

as a sort of bridge between the molecules of the chemist and the organisms of the bacteriologist.

The wonder-working sulfa drugs and the even more miraculous penicillin are almost without effect in the treatment of virus diseases. However, great progress in the control of virus diseases has been made through the use of two basic procedures, one of which was established 3,000 years ago and the other was probably used by Pasteur in 1884.

Three thousand years ago it was known that when the contents of smallpox pustules were rubbed onto areas of lightly scarified skin the resulting attack of smallpox was often very light, many times only a skin reaction at the point of inoculation. It seems probable that the smallpox virus was modified by repeated skin passage, less certainly, however, than the modified virus vaccination introduced by Jenner in 1798. Jenner's method, inoculation with an active virus which has been modified by passage in an unnatural host, speedily came into use throughout the world and is still used. The inoculation of an unmodified virus by an unnatural route (laryngotracheitis vaccination) and the simultaneous inoculation of an unmodified virus and injection of an antiserum (anti-hog cholera vaccination) are but variations of the procedure.

The second basic procedure which has proved useful in the conquest of virus diseases is the use of inactivated virus. In Pasteur's classical experiments in the use of a vaccine against rabies, he employed this principle since, in his 14 injection treatment, the virus in the first 5 to 8 injections was inactivated. This method has been exploited only recently, chiefly because it was long generally accepted that inactivated virus fails to confer immunity. In recent years the idea that inactivated virus can produce immunity has come to be accepted and we have encephalomyelitis vaccine, two hog cholera vaccines, canine distemper vaccine, pneumoencephalitis vaccine, etc. It appears that the use of inactivated viruses will be increased greatly in the future and will introduce a new epoch in conquest of disease. Influenza seems destined to succumb to this method of attack in the near future.

The 1918 influenza pandemic killed 15 million persons in four and one-half months, a greater number than were killed in four and one-half years in World War I. The annual expenditure since 1918 for searches for the cause and means of preventing this disease have been less than the cost of a single bomber. "The public should insist that the attack on these invisible agents of disease be pursued with the same vigor with which the attack on our visible enemies is now being made. Research is the foundation of this attack and with increased emphasis on research we shall eventually realize the true conquest of virus disease."

## DDT Found Highly Toxic to Fish and Frogs

DDT has been found to be more poisonous to cold-blooded animals (fish and frogs) than to mammals, in experiments[34] performed at the University of Missouri Medical School.

A practical significance of this investigation is hinted when the investigators suggest that DDT is of interest in connection with the proposed use of DDT in sections where malaria is endemic against the larvae of the mosquito vectors of that disease. Thus wholesale spraying of swamps and ponds with DDT can be expected to kill a great many fish, frogs and other cold-blooded animals and also insects.

## New Test for Brucellosis

In herds of cattle in which several animals are infected with *Brucella abortus* it is common observation that many develop only low serum agglutination titers. Most of these, in herds in which the infection has long been present, in time become negative to the test. The standard practice is to slaughter such animals or retain them as infected animals that are unsafe. Usually such practice is uneconomical.

In a study of the bactericidal and growth-inhibiting action of bovine blood plasma for *Br. abortus* the authors[65] found sufficient differences in the action of plasma from infected and non-infected animals to differentiate one from the other, regardless of the agglutination titer.

The plasma from infected animals failed to inhibit the growth of a smooth culture of *Br. abortus*. The plasma from normal animals, from animals exposed to the infection but not infected and from animals vaccinated with killed organisms, inhibited the growth in varying degrees.

The test can be developed easily into routine laboratory procedure and by its application save many animals that have heretofore been sacrificed because the agglutination test does not distinguish between the infected animal and the one that has recovered from the disease or is immune.

[34] Ellis, M. M., Westfall, B. A., and Ellis, M. D. *Science*, 100:2604 (Nov.), 1944.

[65] Huddleston, I. Forrest; Wood, Evelyn, and Cressman, Audrey. The differential diagnosis of bovine brucellosis from the bastericidal action of blood plasma. *Sci.* 101:2623, p. 358, 1945.

## Diagnosis of Anthrax

During the ordinary course of diagnostic work opportunity has arisen to try the stevenel blue staining method as described by Simeons (1943) on blood smears from animals suspected of having died of anthrax. The blood smears were taken at various intervals after death, sometimes as long as ten to twelve hours. Many smears have shown heavy contamination with spore-bearing organisms other than B. anthracis. At first, positive results were always checked and confirmed by MacFadyean's (1903, 1904) method, i.e., with polychrome methylene blue.

The stevenel blue method as originally devised is not sufficiently precise for a diagnosis of anthrax, though a tentative positive diagnosis is usually found to be correct when checked with polychrome methylene blue. The use of eosin obscures capsule staining and renders diagnosis difficult. However, if all eosin is omitted the results are unequivocal and, in our opinion, at least as good as those given by MacFadyean's method. For routine diagnosis we recommend the following:

Fix in methylated spirits (or alcohol) half to one minute.

Wash in water.

Immerse in stevenel blue five to six seconds.

Wash, dry and examine.

The sevenel blue is prepared in the original way: 1gm methylene blue and 1.5gm potassium permanganate are separately dissolved in 75cc amounts of distilled water. The two solutions are mixed and a heavy precipitate forms. The mixture is placed and kept in a boiling-water bath for thirty minutes and then filtered through paper. The filtrate keeps well and improves with age.

The advantages of the method are speed, economy and precision. A smear can be fixed and stained in less than one minute, and since the staining is done by immersion there is relatively little wastage.

The bacteria are sharply stained purple and show definite "square cut" ends. Around them is a clear unstained area which itself has a definite periphery in the form of a thin purple staining line. The red blood cells are stained green. By contrast with the polychrome methylene blue method, the bacteria appear smaller and more sharply outlined, while the capsule appears more definitely and evenly around the bacteria. It has been noted by many workers that with MacFadyean's method the capsule appears distorted and very often "lop-sided"; this is not the case with the modified stevenel blue method.

It is probably impossible to overstain. We have stained smears for as long as ten minutes in stevenel blue and excellent capsule formation has still been demonstrated. However, differentiation is better after only five to six seconds, and this we recommend.

MAJOR F. W. PRIESTLEY, R.A.V.C.
and RISALDAR SYED ZAHUR MEHDI, I.A.V.C.
—*J.R.A.V.C.*, 15:4, 1944.

## New Treatment of Indolent Wounds

The use of a powdered preparation of sheep's heart prepared at the Department of Experimental Pathology of the Hebrew University, Jerusalem, for the treatment of non-healing ulcers, has been reported by Kerr and Werner.[67]

Of 36 cases in which the patients had been subjected to many accepted methods of treatment—occlusive, elastic bandages, sulfanilamide powder with tulle gras, petrolatum dressings, plaster of paris and skin grafting—without success, recovery occurred in 90% through the use of the powdered sheep's heart.

## Mastitis Due to Infection Other than Streptococcus Agalactiae

The author[36] reports on a severe outbreak of clinical mastitis occurring in a self-contained, attested herd of 50 to 60 pedigreed dairy Shorthorn cattle where, in the previous three years, clinical mastitis (in no case due to *Str. agalactiae*) had been observed in less than six cows per year. In the diagnosis of infection the majority of samples contained over 1,000 streptococci per ml. Streptococci were recovered from all grossly abnormal samples examined in numbers, never less than 250 per ml.

All the clinically affected animals received sulfanilamide *per os* (3 ounces, followed by 1 ounce every 12 hours for a week), 24 hours from the day of occurrence of clinical mastitis or a few days later. It is questionable whether or not sulfanilamide was effective in relieving clinical symptoms.

It is certainly significant that *Str. agalactiae* was at no time recovered from any of the cows.

The author concludes that all milking machines should be fitted with two vacuum gauges. When any disagreement between the two occurs they should be tested by the county advisory service. Certification of gauges and provision for a fool-proof device, limiting the vacuum so that it is harmless to the cow, is advocated.—*A. H. Bryan.*

[36] Neave, F. K., Sloan, J. K. B., and Mattick, A. T. R. An outbreak of clinical mastitis involving 26 cows in a herd believed free from *Streptococcus agalactiae*. *Vet. Rec.*, 56:39, pp. 349 to 351, 1944.

[67] Kerr, A. B., and Werner, H. The clinical value of a growth promoting substance in the treatment of indolent wounds, *Brit. J. Surg.* 32:281, 1944.

## Survival of Sheep Nematodes on Pasture

Hawkins, Cole and Kline[62] in a review of the literature find that 10 investigators—Ransom, Dikmans, Andrews, Kammlade, Graham, Boley, Broughton, Hardy, Baker and Rebrassier—have reported that the common stomach worm of sheep, *Haemonchus contortus* and the nodular worm, *Oesophagostomum columbianum* survive on infected pastures during the winter months and are infective in the spring. Eight investigators—Veglia, Mönnig, Griffiths, Swales, Shorb, Dinaburg, Sarles and Kates—report that these parasites do not survive the winter on infected pastures and that they perish in two to four months during the summer season if sheep are kept off the pastures. Hawkins and associates throw their support to the non-survival group—thus giving it a majority of one.

On a plot of ground to which infected sheep had had access from May 22 to September 1, the authors placed parasite-free lambs for two-week periods beginning September 12, October 3, November 4, December 23 and January 15. The lambs were held in non-infected quarters for three weeks after removal from the pasture and then were slaughtered and the nematodes counted.

In the January 15-28 period no infection of Haemonchus, Ostertagia, Oesophagostomum, Chabertia or Monezia was acquired. Light infections of Cooperia, Trichostrongylus, Nemotodirus and Trichuris were acquired in this exposure 4½ months after infected sheep had been removed from the pasture.

It appears from the nematode counts of the group exposed in September and October that the stomach worm and nodular worm infection on the pasture was very light at the beginning of the experiment. One other factor not taken into consideration by the authors in reaching a conclusion that the more important nematode parasites of sheep do not survive over winter on contaminated pastures, is that the 2½, 3½, and 4½-month tests were made at a season when climatic conditions may have rendered the worm embryos non-infective. The possibility exists that with the return of warm weather, even several months later, these non-infective embryos might again have become infective. Although this possibility seems remote, it could explain contrary conclusions by other investigators.

[62] Hawkins, Philip A., Cole, C. L., and King, E. E., Studies of sheep parasites IV. Survival of nematodes on pasture during the fall months. *J. Parasit.* 30:6, pp. 373-376, 1944.

*Buy war bonds—and hold them*

# Book Reviews

**A Shorter History of Science.** By *Sir William Cecil Dampier*, Cambridge University. 189 pages; 22 illustrations. Published by The Macmillan Company, New York, 1944. Price $2.00.

The most amazing thing about this work is the vast field covered in a book of this size. Physics, biology, chemistry, medicine, pschology, anthropology, mathematics—all are marshalled and marched before the reader in orderly arrangement from the Paleolithic Age to the present day. Nor is there a dull page in this streamlined storehouse of information. It is a lucid exposition of the development of all branches of the physical sciences from their humble source in magic through the ancient and medieval periods, through the Renaissance and to the latest of modern contributions.

It has often been said that no one can know much about a subject until he knows its history. Veterinarians, who are scientific men, will welcome this opportunity to inform themselves, from a volume so compact, of the history of all sciences and their relation to our culture.

**Radiology in Canine Practice;** A Text on Applied Radiography and Diagnosis. By *Gerry B. Schnelle*, V.M.D., Assistant Chief Veterinarian, Angell Memorial Hospital. 336 pages; 245 illustrations. Published by the North American Veterinarian, Evanston, Illinois, 1945. Price $5.00.

This is a very satisfying text. An outstanding feature is the metriculous care the author has exercised to tell everything that is necessary in each use of the X-ray and yet not become tedious. Entering as it does an unoccupied field and discussing the subject acceptably this work is sure of an enthusiastic welcome and it will serve a useful purpose.

The work, like all Gaul, is divided into three parts. Part I is a brief description of principles, equipment and technic of radiography. Part II deals with diagnosis in suspected fractures, osteogenic tumors, rickets, etc., and Part III discusses use of the X-ray in examination of the soft tissues. For this purpoe the author finds it useful in a truly surprisingly extensive list of conditions. Parts I and II are profusely illustrated and documented with reports of many cases treated by the author. Many therapeutic hints are interwoven into the discussion of examination and diagnosis.

While the work is intended primarily to assist the beginner and the occasional user in the use of the X-ray, the experienced and the expert also will find in it many useful suggestions.

The only omission appears to be a discussion

of the investment required for radiography, the cost of maintenance and operation, the percentage of the average run of hospital cases in which X-ray examination is indicated, the time required for its full use and the income to be expected from one's investment of funds and effort. Such information would aid a veterinarian in deciding whether or not to add radiographic equipment to his facilities.

**Any book reviewed in these pages, or any other book if available, may be obtained by remitting the published price to VETERINARY MEDICINE, 7632 S. Crandon Ave., Chicago 49. Bulletins and Circulars should be requested direct from the address given in the notice. Generally they are supplied free unless a price is stated.**

* * * *

**A Source-Book of Biological Names and Terms.** By *Edmund C. Jaeger,* Riverside Junior College. 256 pages; numerous illustrations. Published by Charles C. Thomas, Springfield, Ill. 1944. Price $3.50.

With a good medical dictionary, one may read medical and veterinary literature understandingly and from it learn enough of the components making up a new or unfamiliar word to pronounce it, spell it and remember it—within limits. At worst one who owns a dictionary will hardly say "streptocockeye" or refer to the *disposition* of positive reactors in the brucellosis project—or, save the mark! the *disposition* of carcasses of swine, dead of cholera. Not that "disposition" cannot be strained to serve in this sense, but that one having a choice of words would not, ordinarily, choose the least applicable for the purpose.

The same principal applies to the use of "bovine," "equine," "ovine," etc., as nouns. Recent general lexicons permit them to edge through a crevice into the house of words that was long closed to them. But medical dictionaries do not recognize them at all, which should give at least a hint to the writer on medical and veterinary subjects. These words are dearly loved by some veterinary students to whom "bovines" seems far more erudite and impressive than "cattle." As nouns, these words should be reserved for such use.

However, this work goes much farther into etymology; discussing the principles of word building and giving the literal meaning of the parts of biological words as well as the special meaning of the combination. All writers of scientific articles can use it with profit.

Fully 12,000 elements from which scientific biological (including both the botanical and zoological groups of sciences) names and terms are constructed are given in the alphabetically arranged vocabulary. Many must have thought that the names evolved by some of the veterinary supply houses for proprietary preparations were something "new under the sun." Well, they are not new; i.e., as a class. In this work generic terms are classified as (1) mythological names, (2) geographical names, (3) classical names, (4) barbarous names and (5) nonsense names.

The medical lexicons will serve most of us better than this work because we are more apt to use them, but there are two groups of veterinarians the reviewer would like to see read and ponder it.

1. Those who would coin new names, particularly patronymic terms, e.g., bangiosis or bangellosis might have commemorated a distinguished veterinary bacteriologist as salmonellosis honors a distinguished veterinary pathologist and listerellosis does homage to a great surgeon. But "Bang's disease" never had a chance to survive. Its obsequies were held at the recent meeting of the U. S. Livestock Sanitary Association. Careful writers have long since eschewed it.

2. Those who add common affixes to established words of decent lineage to form neologisms, not recognized by any lexicographer, nor likely ever to be so recognized, e.g., abscessation; and those who use "anesthesized," "cathected," etc., as verbs, or imaginary adjectives as "mastitic" (milk), where an existing noun would serve much better, or who use combinations of letters without meaning, as "per orum," "caesarotomy,' etc.

There is a tendency to answer criticisms like the foregoing with, "Aw, it doesn't matter. You know what I mean." It does matter, however; our literature, the whole of it, is the principal criterion by which men of other sciences judge the veterinary profession. Anti-hog cholera serum, anti-canine distemper serum, etc., terms already fixed in the veterinary vocabulary, are handicaps enough.

* * * *

## Useful Bulletins, Circulars, Etc.

**Annual Report Montana Livestock Sanitary Board**—State Veterinary Surgeon, Helena, Mont.

**Report of the New York State Veterinary College** at Cornell University for the Year 1942-43. Ithaca.

**Report of the North Dakota Livestock Sanitary Board** for Years 1943-44. Dr. T. O. Brandenburg, State Veterinarian, Bismarck.

**Diseases of Sheep.** Kentucky Agr. Exp. Sta., Lexington.

**Report, Division of Veterinary Science** for 1944. Michigan State College, East Lansing.

**Better Pastures.** Bul. 505, Illinois Agr. Exp. Sta., Urbana.